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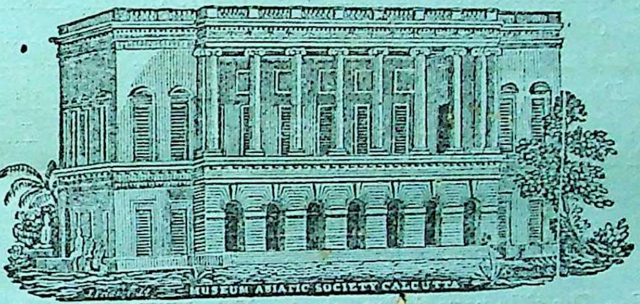

"The bounds of its investigation will be the geographical limits of Asia: and within these limits its inquiries will be extended to whatever is performed by man or produced by nature."—SIR WILLIAM JONES.

⁂ *Communications should be sent under cover to the Secretaries, Asiat. Soc., to whom all orders for the work are to be addressed in India; or, in London, care of Messrs. Trübner and Co., 57 & 59, Ludgate Hill.*

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CONTENTS.

Page

I.—*On Himalayan Glaciation.—By* J. F. CAMPBELL, *F. G. S.,* 1

II.—*Note on the preceding Paper.—By* H. B. MEDLICOTT, *Superintendent of the Geological Survey of India,*...................... 11

III.—*List of the* Mollusca *brought back by* DR. J. ANDERSON, *from Yunnan and Upper Burma, with Descriptions of new Species.—By* G. NEVILL, *C. M. Z. S.,*................................ 14

IV.—*Descriptions of three new Species of Birds of the Genera* Pellorneum, Actinura, *and* Pomatorhinus; *lately collected in the neighbourhood of Saddya, Assam, by* MR. M. J. OGLE, *of the Topographical Survey.—By Major* H. H. GODWIN-AUSTEN, *F. R. G. S., F. Z. S., &c.,*.. 43

V.—*Note on the Variation of the Barometric Tides in connexion with Diurnal Land- and Sea-breezes.—By* HENRY F. BLANFORD, *Meteorological Reporter to the Government of India,* (with two Woodcuts),.. 45

N. B.—The title page, index, etc. to Vol. XLV will be issued in a separate wrapper, in a few days.

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JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

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Part II.—PHYSICAL SCIENCE.

CHECKED 1973

No. I.—1877.

I.—*On Himalayan Glaciation.*—*By* J. F. Campbell, Esq., *F. G. S.*

(Read January 17th, 1877.)

[We so seldom have the advantage of foreign opinion upon matters of scientific observation in India, that the Society will no doubt welcome the following notes upon Himalayan glaciation addressed to one of its Secretaries by Mr. J. F. Campbell, so well known for his remarks upon ice-action in every quarter of the northern hemisphere. The notes are left in their epistolary form, which is so well suited to communications that do not pretend to be exhaustive.]

Kotleh, November 19th, 1876, *Kangra valley.*

My dear Sir,—On the 27th Sept. I landed with you at Bombay. By your advice I have come here to look at certain marks supposed to be glacial. Let me refer you to the second volume of '*Frost and Fire*' for marks which I had recognized when that book was printed. Let me refer you to '*My Circular Notes.*' (Macmillan 1875) for references to other papers of mine on glacial subjects, and for the result of my observations during thirty-five years. From these writings you may estimate my knowledge of glacial marks and my opinion.

1. I have now skirted the base of the Himalayas from Hirdwar to Lahore. In the plains of Europe and of North America, I have seen large stones, carried great distances from parent rocks, say from a thousand to fifteen hundred miles, over plains. These commonly are smoothed, polished, and grooved, exactly like stones which are found beneath existing glaciers. These erratics reach as far south as icebergs now float in the

Atlantic, namely, to Lat. 37° N. in America. I have not seen one large stone in the plains of India so far as I have travelled, except stones carted and carried by men for building purposes. Of these not one was striated.

2. I have been to Simla, and to "Monsuri" (so named by the people), and for short distances inland. In Scotland, Scandinavia, the Alps, and in North America; in Labrador, and in Vancouver's Island: in all northern countries where marks of ancient glaciations abound, and where I have travelled to study them; I have seen rocks and mountains of a particular rounded form, on which grooves mark out the course of the ancient glaciers or icebergs which moved over these rocks and rounded them. In Scandinavia horizontal grooves are visible on the large scale from end to end of fjörds more than a hundred miles long, up to a height of more than a thousand feet above the sea level. All the rocky islands which stud the Norwegian coast are striated, up to considerable heights, and great blocks of transported stone are poised upon the hill-tops everywhere. Many of these erratics are angular blocks, as big as small houses. In 1841, I slept under a stone of this kind with fifteen other persons, guides and travellers, upon an Alpine glacier, Such stones abound in Scotland, and in Ireland, some as high as three thousand feet, and rest upon the tops of isolated mountains. I have not seen one "perched block" in the lower Himalayas, nor have I seen one hog-backed ridge ⌒ or one rounded valley ◡. I have seen every where far and near, with my telescope, and at my feet a constant repetition of the form V which I attribute to the action of running water, *not* to glacial action.

3. I went to Hirdwar, to the exit of the Ganges from the basin in which that river and its branches take their rise in glaciers. I have photographs of these glaciers. In all the glaciated countries that I have visited, the ends of great basins of this kind are abundantly strewed with glaciated stones. I sought carefully from Deira to Hirdwar, and from Hirdwar to Roorkee along the Ganges canal, and I did not find one glaciated stone there.

4. It sometimes happens that large glaciated stones are found in rocks consolidated, and classed geologically as old rocks;—"old red sandstone," &c. I have looked at the "Siwaliks," at the rocks which contain fossils of large extinct animals. I have not seen one glaciated stone in these beds. The fauna of the Siwaliks &c. as described in books, indicate a warm climate, like that which now exists here, and do not indicate anything glacial.

5. From Pathankote (here named "Puttànkote") to Nurpur, I crossed the mouth of a wide valley in which are several large rivers which take their rise amongst glaciers according to the maps. I saw nothing glacial on that stage. These streams drain the northern slopes of the Kangra range.

6. From Nurpur to this place I have crossed several rivers, which descend from the southern face of a snowy range behind which rivers flow which I crossed yesterday. The range is some 12 or 13,000 feet higher than my road, according to the maps, and the top of it is distant about 12 or 13 miles. I have seen a vast number of large stones near these rivers. I have not seen one stone or one exposed rock surface with any mark of glaciation along my route thus far. Several large stones, some of granite, are below this house. Their surfaces are well preserved, and they are all dinted by rolling, not striated by sliding.

7. Where rivers are cutting through old moraines, they constantly undermine and wash out glaciated stones. A small rivulet near Dunrobin in Sutherland is full of large striated stones, washed out of an old moraine of large size. The plain rivers below Chicago in America also wash out large glaciated boulders which come from beyond Lake Superior. I have seen no such stone here, and nothing that has the remotest resemblance to any moraine that I ever saw anywhere. A fall of about a thousand feet in a mile, and the vast rainfall of these regions suffice to explain the transport of far larger stones than any which I have seen thus far in India. A very large stone was moved more than a hundred yards this year at Kalka, by the small river which there enters the plains. The stone was known because it had long been used as a washing stone. The fact was remembered because two washermen were carried away and drowned by a sudden flood. The slope at Kalka is far less than the slope here. Thus far I have seen nothing to suggest the action of ice at low levels between Hirdwar, and Lahore, Pathankote and Kotleh.

8. So far as I can see now, my distant observations from Simla with a telescope, are confirmed by detailed examination of this ground.

9. I say nothing of that kind of geology which belongs to professional men. I see enough to convince me that there is professional work on this ground for many expert geologists for many years. But generally it seems to me, that a part of the plain, formed of old as the plain is now forming, has been crumpled up against the older rocks, probably by a thrust. I saw a folded section in the right bank of the river at Nurpur yesterday with an expiring camel on the shingle to shew how "siwalik" fossils got buried of old by streams like those which now flow into the plains. They form "Deltas" △ or, if the new name is preferred fans, which now extend ten or twelve miles into the plains. These commonly spread till they meet so that a whole series make something like a continuous formation whose section must vary with the intermittent flow of rivers. Such a section of alternate beds of pebbles, shingle, sand, and brown mud I have seen in crossing the crumpled rocks which are named "Siwaliks" and "Nahuns" (?) hereabouts, and near Deiradun, I have no geological map,

and a passing traveller cannot hope unaided to unravel the complications of beds which I see here. I saw another folded E.—W. section to-day in a river bank. I do not therefore concern myself with that kind of geology which belongs to your department. I confine myself to marks of glaciation with which I have made myself familiar. About Lat. 30° 31′ I have found none in India thus far.

10. I have looked carefully for sea-margins along the foot of hills. All round Scandinavia, in Scotland, in "the Labrador", and in many other countries, "*terraces*" nearly parallel to the existing sea level mark old sea levels before the land was last raised. The form is very conspicuous, and the cause of it is often manifested by the discovery of recent shells in the sand and mud in which they died. I looked from Pathankote westwards, and saw the outline of the hills fade gradually into the plains at an angle of about five degrees. There was no semblance of a raised sea margin towards Kashmir. I have seen nothing like a "terrace" on the lower hills towards Hirdwar or beyond it. I never read of the discovery of recent sea shells anywhere in these regions. There is nothing hereabouts to suggest the agency of "floating ice" in lake or sea, or of lake or sea to float anything in.

11. But as avalanches do fall into these Indian rivers, and make snow bridges, fragments of hard snow, or of glaciers, may possibly float down streams, and carry stones on ice rafts. Thus far I have seen no stones to suggest that possible method of transport by floating ice. The glaciers of which I have photographs are full of fallen stones, angular as they were when they broke from the cliffs. I have not seen one such stone in any river course that I have crossed. All the river stones are rolled.

12. From my recent observations I see no reason to assume any great difference in this climate since the Sivaliks were deposited; since many kinds of extinct elephants lived hereabouts, with large saurians, like those which live in plain rivers now. I have found nothing to indicate a glacial period in India. What I noticed in travelling round the world you will find in the "circular notes" quoted above of which copies were at Bombay and Simla when I passed.

13. *Kangra*, 20*th.*—I passed yesterday over ridges which have been called "moraines." My way led down stream to a fork, and then up stream to a level country. The gorge is manifestly cut by the river, and gives a section of beds of sandstone with a northerly dip. I noticed some large, rounded stones in the sandstone and some were "horse tooth" granite. Consequently the transport of such stones went on during the formation of these tilted beds. Near the top of the gorge I came to a thick bed of large rolled stones of many kinds. The bed seems to rest unconformably on the sandstones, on both sides of the river and to cover a considerable

area though generally hidden beneath the soil. At a place called "Cowlee" I found a great number of very large stones in and about a river, which is crossed by a bridge. They are far larger than any that I have found elsewhere. I measured one roughly 12 × 8 × 8 feet, and another 15 feet long. Many thousands of stones near this size have been washed out of the matrix which is hard reddish sandy stuff like the soil of the fields. As stones of this great size give reason to suspect glacial action, I sought carefully for marks. I went to the banks from which stones projected and found the surfaces where newly exposed, perfectly preserved. These were all smooth, or dinted, water-worn surfaces. There was no sign of striation on any stone that I examined. After a long search I came to the conclusion that these great stones were rolled to their present resting-place, and that this is not a "moraine," but a "Delta."

Near Kangra a view is got which shews that the region crossed, in which these unusually large stones occur so abundantly, is the estuary of a number of streams which come out of a rocky amphitheatre furrowed by steep V watercourses, which begin at the top of the ridge, at the snow. From each of the larger furrows, extends a ridge of stuff which has been taken for a moraine. I am quite certain that I crossed no moraines. An old "moraine" consists of angular stones carried upon the surface of a glacier; of stuff carried in the ice; and of stones pushed along beneath the ice. There are medial and lateral moraines; the terminal moraine forms at the end of a glacier and makes a crescent-shaped rampart crossing a valley. It often forms a lake, like a "bund." In these long ridges which I can see from this dâk bungalow, there is nothing like the shape of any kind of moraine. In crossing them I saw no large angular blocks; no small angular stuff; no striated stones, great or small. I can see minute details of the great hill face opposite to me, and there is no smoothed gorge there which could possibly have been the bed of a large glacier. From ridge to base the gorges are angular furrows, between ridges of extraordinary sharpness and steepness, in which the minutest details are picked out in snow, and in shadow. I can only see two small smooth patches on which small glaciers of the second or third order may have rested high up. I am quite certain that the "Kangra erratics" are large "pebbles" washed out of the "Cads," by heavy floods. Stones larger than any that I have yet seen, are nearer to the mountains but they are all rounded. I can hear of no angular blocks, and I have seen none. What water may do in moving stones, is matter of observation and calculation. When a reservoir burst some years ago in England, the water swept away mills and machinery houses, and everything that stood in the way of the flood. I know many cases of extraordinary effects produced by unusual causes of this kind. The force of water depends upon the volume and velocity. Here the velocity must be extreme for the fall is very rapid. The nearer to the hills the greater is the velocity The weight of a stone in water is less by the weight of water displaced. The rainfall at Dhurmsala is 102 inches yearly. From the position of this high ridge at the edge of the plains the rainfall must be exceptionally great. A warm rain falling on deep snow causes an exceptional flood. I know a case in which such a combination worked havoc in Scotland. I cannot measure the area of the basin which I see, but it is large. From its exceeding steepness the water which falls into it, must gather, and flow out of it suddenly and with extraordinary volume, velocity, and force, Water power here seems ample, to account for the moving of the unusually large blocks of stone, which have been called "erratics."

In Java is a volcanic cone 12000 feet high, named Pangerango. A cone is the worst form for collecting water power. Nevertheless at the foot of this cone a stream has dug a gorge, out of which it has shot stones as large as any which I have seen here. There is no question of glacial action in Java. A portion of an inverted hollow cone is good for collecting water power and here is a funnel nearly big enough to hold Pangerango inverted. My opinion is that the Kangra "moraines" are "Deltas" and the "erratics" pebbles of large size, proportioned to great water power. The largest are nearest to the parent rock.

14. I found some beds of rolled stones yesterday in a hard matrix, so old that the pebbles had decomposed. Granite crumbled to sand at a touch; quartzite and slates broke to angular fragments at a tap from a hammer. This bed forms part of one of these so called "moraines." I suspect that it will be found to form part of the "Sivaliks" undisturbed. The place is not far from Kangra, near a river, at a place where a cutting has been made for a road. If I am right in this the same conditions have endured here since the deposition of these coarse pebble beds, and there has been no "glacial period" here since then.

15. I am one of those who believe that rock basins, which hold or have held water, commonly are glacial marks. The absence of lakes from these regions is evidence against glacial action. It has been said that depression at the upper end of a river valley, or elevation at the lower end may account for lakes like those of the Italian Alps. Here, in the dip of the Sivaliks, is evidence of such a movement; but there are no lakes, and I have seen nothing like old lake bottoms any where in these mountains.

I am therefore confirmed in my opinion, that the Alpine lakes and Scandinavian fjords, and Scotch "lochs" are marks made by ancient glaciers of vast size, like those of Greenland. I have seen nothing that bears the smallest resemblance to any of these, the largest glacial marks that I know, here in the lower ranges of the Himalayas. What evidence there may be of the former extension of existing Himalayan glaciers, nearer to them, I do not know from personal observation. But so far as I can learn from photographs, and from people who have travelled in these glacier regions, there is nothing near these glaciers to indicate any extension, that implies any great change in the local climate, any great elevation or a "glacial period," that affected the whole world.

Let me say in conclusion that this opinion founded on observation is contrary to my old opinion founded upon theory. I came prepared to find evidence of extensive glacial action here in Northern India about Lat. 30° 31′. I have found none.

No. 2.

THE KANGRA BIG STONES.

Bhagsu, November 24th, 1876.

16. My dear Sir,—After sending you a paper from Kangra, in order to make sure of my ground I went to "Dhada" on the 22nd. It is otherwise named on the map, but that is the name now used here for a dâk bungalow eleven miles eastwards. I find that traditions regarding the big stones resemble traditions about like stones elsewhere. They are projectiles, about which mythical beings are concerned. One stone in particular is a "deota" fenced in with a square wall, painted, and adorned with flags and flowers. The large group in which it stands is said to be the site of a battle, between hill people and plain people, and these are their missiles. The holy stone was thrown down by Shiv, to a Rani who prayed to him. On that stone I found incised the "spectacle ornament" of Scotch antiquaries in a cartouche. It is on the west side. Some one has painted a pair of feet, to make this also a human figure and a deota. Something like the sun is painted red on the east side, and numerous devices on the south. Hanuman is on the north side of the next stone to the south. The people walk in procession sun-wise about this stone, and do puja to the pictures. I have seen nothing like this stone "deota" elsewhere. At Dhada is the mouth of a V gorge where the fall is about 12,000 feet in four horizontal miles, according to the map. It is a holy spot much used as a place for burning the dead, whose ashes are cast into the stream. It comes from a snow patch high up which is full of large stones. Close to the bridge I found a section of the "Big stone formation" and got to the solid rock surface under it, newly exposed, in a gravel pit. The stuff is sorted in layers of varying coarseness, from fine angular sand to the big stones. The bed rock is *not* glaciated. The thickness of the deposit may be 80 to 90 feet. Manifestly this is the apex of a Delta △, in the jaws of a V ravine, which has direct communication

with a snow patch full of big stones about 10,000 feet higher, and four or five miles distant. I am quite certain that no glacier, big enough to carry these stones, passed over the bed rock, whose surface is well preserved; below the dâk bunglow at Dhada and under the stuff.

17. *Yesterday*, 23*rd*.—I crossed the big stone deposit close to the foot of the mountains, about four miles from the ridge, and 12,000 feet below the crest. I walked eleven miles carefully examining surfaces on stones of all sorts and sizes. I could not find one striated stone on the whole march. I found that granite pebbles as large as corn stacks abound, opposite to the longer and larger gorges which come from the snowy crest, and have the greatest fall. I found none of the kind or shape between these longer gorges, in the jaws of ravines which begin in nearer hill tops. These being slaty, send down slates of sorts, and the ground is covered with flat stones. I conclude that the ground which slopes from these hills to Kangra, is covered by a compound delta, arranged by water flowing from the whole series of streams which I crossed in walking eleven miles yesterday. I was unable to find any trace of glacial action at ten to fifteen miles from the base, or at the very base of the hills in this district.

18. From here I have made a careful drawing of one of three or four high patches on which small glaciers may have rested. New snow makes them conspicuous from a distance. The rocks below them are smoother than elsewhere, and large stones rest on the rocks. These piles of stone have the look of terminal moraines in the snow. They end at about 14,000 feet above the sea-level, or 10,000 above this lower slope. I suppose that small glaciers once lay on these shelves, and that the climate has altered so as to destroy them. Far lower down I have seen hereabouts old snow resting in rock "gulches." In the Alps such places are "couloirs" and "chimneys." As a case to illustrate the effect of such conditions; I was hunting chamois many years ago in Switzerland, opposite to the Shreckhorn, and came to one of these steep narrow snow slopes. My guide told me to hurry over it. I was scarce landed on the rocks when a mass of big stones rolled and bounded past, with great and increasing velocity. Thin slaty stones had got on edge, and whirled past like flying wheels. They came from a small glacier like those of which I seem to see the beds on these Kangra hills; and they never stopped till they got to a large glacier, nine miles wide and twelve to fourteen miles long, which was some thousands of feet below us, in a valley.

That glacier was slowly carrying masses of fallen stones towards the Grimsel. Thence down to Interlaken all marks of enormous glaciation abound. A hot sun started the stone avalanche, by melting ice which supported the stones, on a small terminus moraine. This Kangra ridge is somewhat like the Shreckhorn at the top, and stone avalanches must often roll down on hard snow packed in narrow gulches. I notice that many of the largest stones have something like the shape of mill stones, and rest on a flat side. I think it possible that men may have seen the arrival of some of them, and that tradition ascribes their speed to "Shiv." I ascribe it to gravitation.

19. In the Alps and in Scandinavia I have seen many snow avalanches fall from steep hills, like those which I see from this house. If many square miles of a hill face, were swept of snow by a slide, like the roof of a house in a thaw, the snow avalanche here would certainly block up a deep water-course, form a "bund," and accumulate water power. In this hot sunny region a snow dam could not last. I am told by natives that big lumps of hard snow are washed down to my road of yesterday. Ice dams have formed and burst in the Alps within human memory, and the result in the transport of rubbish was enormous. Not long ago an earthquake and heavy rains sent down from Mount Ararat a mass of snow, ice, mud, and debris, which flowed for twelve miles along a valley of less slope than the Kangra slopes below me, and carried enormous blocks of stone as far as they have been carried here. The great ridge above me has much snow on it, and may have had small glaciers high up, though no large glaciers have left marks on the hills. Causes like those which I have here indicated fully account for this big stone formation. Some probably rolled down upon snow slopes, in gulches, and rolled on over the slopes of deltas. Others may have been rolled down on the bursting of snow "bunds," and may have been washed down normal slopes of gravel and sand by abnormal floods. A thunderstorm, or an earthquake may have helped in a region where the rainfall is said to be 102 inches, and where it may have been as great as it is elsewhere. A combination of such causes at long intervals, accounts for groups of large stones which I find here and there. Being exceptionally large and numerous, these seem to require exceptional conditions.

In any case I am quite certain that there is nothing on the ground which I have crossed to indicate the former presence of large glaciers on the Kangra slopes; either at 12 to 15 miles from the base of the high ridge, or at the base of it, or in the jaws of ravines which come from the crest of it, at Dhada, and elsewhere on my road thence to Bhagsu.

20. One of my objects in coming to India was to see for myself whether I could discover any trace of the "*Ice cap.*" Theoretically, during a glacial period, a crust of ice ten thousand feet thick came from the north pole, and went to the equator. If it did it came down the Himalayan slopes. I have now seen in India enough of jagged sierras, and of ravines of enormous depth and sharpness, of which many run from east to west, to convince me that no ice cap has crossed this region from north to south

2

about Lat 31° 2′. It is impossible that an ice cap can have passed from Thibet, since these gorges began to be eroded. Some are three miles deep, so they must be very old. Forms which exist in the Himalayas prove the ice cap to be impossible. There is absolutely nothing here on which to found a "Glacial period," which produced an "Ice cap." There is no evidence, even of any great extension of local glaciers here. All the change that I can trace is the possible existence here, of small glaciers perched high up, near the crest, where snow now rests. That change of climate may have been the result of something like the atmospheric conditions which make the Sind rainfall about a fiftieth part of the rainfall here; and make the rainfall elsewhere about six times as great.

I am greatly obliged to you for advising me to come here. My object is attained and very pleasantly.

Calcutta, February 14th, 1877.—Had I been present at the reading of this paper, I suppose that the author's right to the last word would have been mine. I have been to Darjiling; to a fourth hill station; and I have now gained some knowledge of points in Cashmir and Bhutan fifteen meridian degrees apart. I have seen a considerable part of Ceylon, and the low country between Bombay and Lahore and along the Oudh and Rohilcund railway, opposite to Nepal. I have had the advantage of reading Hooker's journal, and Mr. Blanford's, within sight of their ground, and I have the benefit of Mr. Medlicott's criticism. I have also read papers by Major Godwin-Austen and Mr. Belt. I see no reason to alter my opinion about the Kangra "big stones." I have seen many as big, in water-courses near Kursiong and Darjiling, left by streams which made the furrows and quarried the stones. The usual water-power is not sufficient to roll these big stones, because the gathering ground above them is too small in area and too low. But given a landslip, sufficient to gather a head of water, and the furrow would be swept by a flood when the dam burst. Numerous landslips of enormous size are visible from Darjiling; but the rivers Rungeet and Teesta have swept their beds clear of all obstructions. At some places very large rolled stones are left in these water-courses. But there are no deposits in the Indian plains comparable to the glacial deposits near Turin, in the Italian plains.

The burden of proof rests upon those who hold to improbabilities, and require conditions different from those which exist. So far as my facts go, they prove that Himalayan glaciers have never extended far from the regions in which glaciers now exist. These hang about the edges of great river basins, below very high gathering grounds of large area, which condense the warm damp atmosphere of the plains, and of the Southern Ocean. I have found nothing in India to prove that these conditions have altered materially since the Himalayas grew to be mountains.

* * *

II.—*Note on the preceding paper.—By* H. B. MEDLICOTT, ESQ., *Superintendent of the Geological Survey of India.*

(Received Jan. 15;—Read Jan. 17th, 1877.)

Mr. Campbell has kindly permitted me to add a few words to his communication, to bring out a small residuum of difference that remains between us upon the question of a former greater extension of ice action in the Himalayas. On the wider question of the Ice Cap, I would only say that I have not understood that speculation as dispensing with local centres of accumulation and dispersion, as requiring the polar ice to have poured over the Himalayas. On the smaller question too, Mr. Campbell has taken up the comparatively easy task of confuting the most extreme opinion. Although there is no mention of names, it is plain that the paper just read is a refutation of Mr. Theobald's Ancient Glaciers of the Kangra District, with a copy of which I had lured Mr. Campbell into visiting that region. I had thought indeed that I had myself said all that was called for in answer to Mr. Theobald, by pointing out that his so called moraines were only ridges of erosion out of a diluvial deposit that must once have filled the whole valley (Rec. Geol. Survey, Vol. IX, p. 56); Mr. Campbell has, however, saved us any further trouble on that score by rehearsing all the well-known signs and tokens that must be left by a heavy glacier, and finding them wanting. In this he has entirely confirmed my own observations.

I was the first (fourteen years ago, Mem. Geol. Survey, Vol. III, p. 155) to bring to notice the big stones of the Kangra valley as probably due to ice. I would beg leave to quote the few words I gave to the subject:

"The most interesting of these deposits is that in which large erratic blocks occur so abundantly along the base of the Dhaoladhar. It first shows itself on the east, about Haurbaug, and is nowhere more strikingly seen than along the steep inner slopes of the duns east of Dhurmsala, where the huge blocks are thickly scattered over the surface. In viewing this deposit as the result of glacial action, I base my opinion chiefly upon the size of the blocks (I measured one twenty-five feet by eighteen, by ten) and upon some peculiarities of distribution. An eye more practised than mine in glacial phenomena might detect more direct evidence, but it certainly is not well-marked, and it is easy to account for the subsequent removal of all such traces of glacial action in such a position as this. The blocks occur at a present elevation so low as 3,000 feet above the sea-level, and they are found through fully a thousand feet in height. They are almost exclusively composed of the granitoid gneiss of the central mass of the Dhaoladhar, from which their area of distribution is separated by a lofty ridge of schists, through deep gorges in which they have evidently been conveyed, a huge block being occasionally found perched on the sides of these gorges, some hundred feet above the present level of the stream; yet in such places I failed to observe any groovings or roundings of the rocky sides. The absence of evidence of this kind may, perhaps, be attributed to the rapidly disintegrating action of the heavy rains. I was many times puzzled to account for the positions in which these erratic blocks occur. They are frequently found on the slopes of the range out of the way of any of these main gorges, and even up the little receding valleys of streams, which only drain the outer hills, and down which the blocks could not have come. Must we superadd the agency of floating ice? The total absence of erratic blocks in other positions is often equally puzzling. The position of this glacial deposit more to the west, in the confined and elevated longitudinal valleys between Sihunta and Choari, impresses one more forcibly with the antiquity of its orgin; it there lies in gaps and on ledges a full thousand feet over the deep drainage gullies close by."

Thus I adopted the opinion while declaring the absence of the usual scorings, and trusting to the facts of great size and peculiar distribution. The first step was an appeal against negative evidence, based upon the possible obliteration of superficial markings, by weathering and attrition, and upon the fact that although it is quite true that *a large glacier* must score its bed and the stones that lie thereon, transport by ice occurs largely without any such marks being made. We have recently had in India, and in this very connection of ice-action, a striking illustration of the unworthiness of such negative evidence. In 1856, Mr. W. T. Blanford declared his conviction that the Talchir boulder-bed was of glacial origin. Every year subsequently one or more of the officers of the Geological Survey were engaged upon these rocks in various parts of India, and looking out for evidence for or against this judgment, yet it was not till 1872 that Mr. Fedden had the fortune to find a most complete case of striated and polished Talchir boulders resting on a scored rock-surface. There are good specimens of these scratched boulders now in the Indian Museum. I have placed a small one on the table for inspection. In the case of the Kangra boulders, any possible glaciers in the Dhaoladhar must have been short, and have had a very rapid discharge; and consequently were of inconsiderable thickness, conditions which would reduce the scoring action to a minimum.

As to direct evidence, the matter of size of the blocks is of course conditional. On an appropriate slope masses of any dimensions may be moved with very little effort. If these Kangra big stones are, as Mr. Campbell contends, solely torrential deposits from the mountain gorges, we have only to work that simple condition so as to account for them wherever found. It is here that a slight discrepancy occurs between Mr.

Campbell's observations and mine. He describes having taken a walk of eleven miles, and found no big stones in some minor gorges draining only from the outer ridges. Relying on this single observation, and perhaps also upon the privilege he claims as a non-professional geologist, Mr. Campbell eliminates and ignores what I have from the first said to be the chief argument for glacial action, that large blocks of the gneiss from the central ridge do frequently occur away from the gorges leading from that ridge, in minor valleys draining only from the outer ridge, where it is most difficult to suppose they can have been placed in the manner he supposes. It was to account for the position of these blocks that I had to imagine their transport on ice-rafts. Instead, however, of insisting on this crucial point, which Mr. Campbell ignores or denies, I am prepared to suggest how it may be compatible with the view he adopts. The fact that coarse diluvial deposits, not derivable from the Sivaliks, are found high over Kangra fort, on the hills south of the valley, makes it certain that the whole valley was once filled with like deposits, which must have reached high along the base and far up the gorges of the Dhaoladhar. It may be that under such conditions the diluvial spill from the gorges was high enough to mantle round and over spurs and to fill little valleys that are now totally cut off from those gorges.

It would be impossible to estimate the plausibility of this supposition without testing it on the ground in view of actual features. At the same time I think that Mr. Campbell can only make out a Scotch verdict of 'not proven' for the ice, as deeply implicated in the transport of these big stones. I cannot bring myself to doubt the evidence that has been given for the former extension of the great Himalaya glaciers to 4,000 feet lower than they at present attain to, as observed by Dr. Hooker, and by Mr. W. T. Blanford in Sikkim. At that time ice-agency must have been very active on the Dhaoladhar. If at present, as Mr. Campbell testifies, lumps of ice are brought by the torrents to the mouth of the gorges, the lumps of those days were probably large enough to pick up the big stones in their way. I would further suggest for Mr. Campbell's consideration, that so far as we can at present estimate it, the age of these high-level gravels along the base of the Himalayas, and to which the Kangra deposits belong, seems to be closely coincident with that of the Ice-Age of the western continents. An increase of glacial conditions in the Alps, corresponding to that proved for the Himalayas in Sikkim, would probably bring the ice down to Interlaken, if not to Neufchatel.

I would conclude these few remarks with the hope that among the many settlers in the Kangra valley, there may be some members of this Society who will study the ground they live upon with some other purpose besides the cultivation of tea.

III.—*List of the* Mollusca *brought back by* DR. J. ANDERSON *from Yunnan and Upper Burma, with Descriptions of new Species.*—*By* G. NEVILL, *C. M. Z. S.*

The following is a list of the mollusca collected by Dr. Anderson on the two Yunnan Expeditions of 1868 and 1874, with descriptions of the new species and varieties; the greater part of the more remarkable novelties from the First Expedition have been already described by Mr. W. T. Blanford, in the P. Z. S. for 1869.

I prepared this list for Dr. Anderson's work on the zoology of Yunnan and Upper Burma about a year ago; since then several of my identifications have been noted by other writers. M. Morelet especially, in a most excellent account of the mollusca of "Indo-Chine," published as the 4th Livr. of the Ser. Conchil. in April 1875, with figures of the new and more important species, entirely confirms my views as to the probable identity of our common *Paludina Bengalensis* with species described from Sumatra, Siam, &c., as detailed further on; he records the occurrence in "Indo-Chine" of our Indian or Burmese *Helix capitium*, *Pythia plicata*, *Planorbis exustus*, *P. compressus* (which he identifies with *P. Tondanensis* from Java and *P. saigonensis*), *Cyclophorus fulguratus*, *C. Bensoni* (this identification I very much doubt), *Ampullaria globosa* and *A. conica*, *Paludina Bengalensis* with its variety *polygramma*, *P. ampulliformis* (= *P. lecythis* Bens., in my opinion doubtfully distinct from Gray's *P. Chinensis*), *P. præmorsa*, *Bithinia goniomphalus* (= *B. iravadica*), *Stenothyra monilifera*, *Melania Touranensis* (which he, no doubt correctly, believes to be only a variety of our *M. variabilis*), and *M. spinulosa*. He also anticipates in publication my views of the correct determination of the very difficult group of *Neritina (Dostia) violacea*: he unites into two species the three forms described and figured in this Journal for 1868 from Burma by Mr. W. T. Blanford, viz., *N. violacea*, Gm. (= *crepidularia*, Lam.) with *N. drepessa*, Bens., as a variety, and *N. cornucopia*, Bens., which he considers as specifically quite distinct, in which I decidedly agree with him, though we are both in opposition in this matter to the greatest living authority on the genus, Dr. E. von Martens, who, in his recent monograph of *Neritina*, for Küster's Ed. Conch. Cabinet, unites all three forms into one.

The late Prof. Deshayes in Vol. X of the Nouv. Archives du Muséum (1876) gives a list of mollusca, collected lately in Cambodia by Dr. Jullien, in which many interesting forms, allied to our Indian genera, are fully described and figured; unfortunately, unlike M. Morelet, he entirely ignores the neighbouring Indian and Burmese regions and seeks for allied forms in South America. As well as I can judge without actual inspection of his types, he describes varieties of our *Paludina Bengalensis* as *P. Chalangnensis* and *P. speciosa*, a variety of our *Melania variabilis* as *M. Jullieni;* his *Unio anceps* is wonderfully close to some upper Burmese varieties of *U. Bonneaudi* and should be compared with it; his *U. comptus* and *U. Crossei* also require comparison with Burmese forms; the former I fear may prove identical with my *Unio fragilis;* his *Paludina obscurata* is also found in Penang, and I believe it has been previously described.

A more accurate and ample report on the mollusca of the same region is published in the Journal de Conchil. for October 1876 by MM. Crosse and Fischer, in which the peculiar thick-shelled group of *Paludina Siamensis* is compared to that of the American sub-genus *Melantho;* I would call attention to the presence of a remarkable Bengal form of the same group, the *Paludina crassa* of Hutton, which has the singular habit of burying itself in closely packed groups of numerous individuals in the mud at all seasons, as accurately recorded in Hutton's excellent original description; our Cachar *Solenaia soleniformis*, Bens., so closely resembling South American species of *Mycetopus*, is also perhaps worthy of special remark in connection with MM. Crosse and Fischer's comparison of the *Unionidæ* of "Indo-Chine" with those of South America; I would also record here that a species of *Canidia* was lately discovered in the Rangoon river by Dr. Hungerford; it is the *C. Bocourti* of Brot (l. c., Pl. XII, fig. 6). M. Brot seems to have most thoroughly and undeniably fixed the proper systematic position of this interesting genus in the family *Buccinidæ*, instead of the *Melaniidæ*, where it had hitherto been classed.

I have given figures in the 'Report on the Zoology of Yunan,' which Dr. Anderson is about to publish, of the following species described in this paper,—*Helicarion resplendens, Trochomorpha percompressa, Glessula fusiformis, Bithynia turrita, Margarya melanoides, Paludina heliciformis*, var., *Paludomus Burmanica, Unio fragilis, U. Andersoniana, U. Feddeni*, and two varieties of *U. Bonneaudi*.

TROCHOMORPHA PERCOMPRESSA, Blf.

Helix (Sivella) percompressa, Blf. P. Z. S. 1869, p. 448.

The single type specimen in the Museum collection, found on the First Expedition at Bhamô, remains unique.

NANINA (ROTULA) ARATA, Blf.

Nanina (Rotula) arata, Blf., P. Z. S. 1869, p. 448 (Bhamô).
Helix arata, Blf., Con. Indica, pl. 82, figs. 8—9.

Very closely allied to *N. anceps*, Gld., but may, I think, be fairly separated; the spire is considerably higher, and the base of the body-whorl more excavated round the umbilicus; the keel at the periphery is less acute and the epidermis appears to be darker; the sculpture is precisely similar; the Museum possesses specimens of *N. anceps* from Tenasserim, also from Moulmein. Dr. Anderson found *N. arata* tolerably abundant at Bhamô and Ponsee; the specimens from the latter locality are rather smaller and are the var. *minor* of Blanford.

NANINA (MACROCHLAMYS) RESPLENDENS, Phil.

Helix resplendens, Phil., Zeits. Mal. 1846 (Mergui).

This species was found abundantly at Bhamô and in the second defile of the Irawady. The specimens are quite undistinguishable from others in the Museum from Mergui (typical locality). I think it doubtful if Godwin-Austen's *N. atricolor* from the Shisha Valley will prove really distinct.

The figure in the Con. Indica, pl. 5, fig. 4, is not characteristic of the species; it appears rather to represent *N. vitrinoides*.

NANINA (MACROCHLAMYS) HYPOLEUCA, Blf.

Nanina (Macrochlamys) hypoleuca, Blf., J. A. S. B. 1865 (Akoutong).
Helix hypoleuca, Blf., Con. Indica, pl. 64, figs. 6, 7.

A single specimen of this well-marked species was found at Bhamô; there are also specimens in the Museum from Pegu, Arakan, and Mergui.

NANINA (DURGELLA) HONESTA, Gld., var. ANDERSONIANA.

Helix honesta, Gld., Pr. Bost. Soc. 1844 (Tavoy).
Nanina honesta, Gld. var., Stoliczka, J. A. S. B. 1871, pl. 17, figs. 7-9.

This species a good deal resembles an Assam form; its thicker and more shining substance, less open perforation, less oblique peristome (which is considerably more broadly reflected, nearly covering the perforation), and its possessing a whorl less will, however, distinguish it. Typical *N. honesta*, as admirably figured in the Con. Indica, pl. 90, fig. 10, is found at Pegu, Moulmein, and Thyet-Myo; var. *andersoniana* at Thyet-Myo, Sibságar, Naga and Khasi Hills, Chittagong, and East Cachar; Dr. Anderson also found it at Ponsee, Ava, Nantin, and 2nd Defile (Irawady). This variety is distinguished by its less depressed shape, it is scarcely if at all angled at the periphery (the angulation being very distinct in type form), the peristome not quite so broadly reflected over the perforation; the substance and texture, perforation, shape of the aperture, and number of whorls are identical.

Type of var. *andersoniana*, from Ponsee: axis 6¼, diam. 11 (apert. alt. 4, diam. 5½ mil.).

Specimen from Chittagong: axis 7, diam. 13 (apert. alt. 6, diam. 6½ mil.).

Specimen from Khasi Hills: axis 7, diam. 15 mil.

Typical *N. honesta*, from Pegu: axis 6, diam. 12 (apert. alt. 5½, diam. 6½ mil.).

NANINA (SITALA) ATTEGIA, Bens.

Helix attegia, Bens., A. & M. 1859 (Phje Than); Con. Indica, pl. 86, *fig.* 7.

This species was found at Prome and Bhamô; the museum also possesses specimens from Moulmein, Assam, and Preparis Island.

NANINA DIPLODON, Bens.

Helix diplodon, Bens., A. & M. 1859, p. 187 (Teria Ghat); Con. Indica, pl. 60, fig. 8.

A few specimens were found at the 2nd Defile below Bhamô and also at Ponsee in Yunnan. The outer tooth of the aperture varies slightly in shape. This species seems to be allied to the *Sesara* group.

NANINA (ROTULA) PANSA, Bens.

Helix pansa, Bens., A. & M. 1856, p. 252 (Akoutong); Con. Indica, pl. 56, fig. 1.

Found at Prome and also at Kalawat.

NANINA (MICROCYSTIS) BARAKPORENSIS, Pfr.

Helix Barakporensis, Pfr., P. Z. S. 1852, p. 156 (Titalya, &c.); Con. Indica, pl. 87, fig. 7.
Nanina (Kaliella) Barakporensis, (Pfr.) Blf., J. A. S. B.

A single specimen only was found at Bhamô. The differences between the sub-genera *Kaliella* and *Microcystis* appear to be not yet sufficiently characterized.

HELIX (PLECTOPYLIS) ANDERSONI, Blf.

Helix (Plectopylis) Andersoni, Blf., P. Z. S. 1869, p. 448; Con. Indica, pl. 112, fig. 8; Godwin-Austen, P. Z. S. 1874, p. 612, pl. 74, *fig.* 9.

This remarkable form was not obtained on the Second Expedition; it was originally found at Hoetone and Bhamô.

HELIX (PLECTOTROPIS) TAPEINA, Bens.

Helix tapeina, Bens., J. A. S. B. 1836, p. 352, (Sylhet).

The type specimens of Benson's *H. tapeina* are in the Indian Museum. Plate 15, fig. 6 of the Con. Indica well represents the form. It is distinguished from all other allied species by the less oblique columellar margin, rounded and not angular at the base (as are all its varieties); the keel at the periphery is acute. Typical *H. tapeina* is found abundantly at Cherra Punjee and in Assam.

var. AKOUTONGENSIS, Theob.

Helix akowtongensis, Theob., J. A. S. B. 1859, p. 306; (not Con. Indica, pl. 15, fig. 4).

Only differs from the preceding by its more oblique columellar margin, more acutely keeled periphery, slightly more open umbilicus, and more depressed spire. I look upon this form as doubtfully separable from the next: the differences may be merely perhaps incidental to individuals, and not even to local races.

Dr. Anderson found this variety in Upper Burma, where it was very common. There are also specimens in the Museum from Ava and Thyet-Myo.

Axis 5, diam. 15 mil.

var. ROTATORIA, Busch.

Helix rotatoria, v. d. Busch., Phil. Abb. 1842 (Java); Mouss., Moll. Java, pl. 2, fig. 8.

Only distinguished from the preceding variety by the less distinct or less excavated sutures, by the very acutely keeled periphery, and by the very white, more thickened, and less rounded margins of the aperture, showing within a distinct emargination at the periphery. Plate 15, fig. 5 of the Con. Indica is an excellent representation of this form; it only differs from the figures of Mousson and Philippi by its slightly more raised spire.

There are specimens in the Museum from Prome, Akoutong, Assam, and Khasi Hills; it was also found by Dr. Anderson at Manwyne and Shan Hills.

Specimen from Akoutong, axis 6, diam. 15½ mil.

var. BHAMOENSIS, nov.

Distinguished from typical *H. tapeina* by the last whorl, which is only slightly angular and not distinctly keeled; the aperture is smaller and less produced, with the columellar margin slightly oblique and angular at base; it is smoother and less depressed than var. *rotatoria*, with squarer aperture and without the acute keel at the periphery. The raised spire and angulate (not keeled) periphery agree with those of *H. phayrei*; it is, however, smoother, less openly umbilicated, with more contracted aperture and less developed sculpture than that species.

This variety connects *H. tapeina* almost insensibly with *H. catostoma*, Blf., and its varieties; the more raised spire, less open umbilicus, and more rounded and regular margins of the aperture, without any sign of being thickened or subdentiform at their base, are the best distinguishing characteristics.

Four typical specimens of this variety were found at Bhamô. Major Godwin-Austen has also presented some similar specimens from the Naga Hills. Plate 15, fig. 10 of the Con. Indica looks to me as much like this variety as it does the shell it is said to represent (that is, *H. Arakanensis*, Theob., J. A. S. B. 1864, p. 5), from which, however, it is easily distinguished by its more open umbilicus, less conically raised spire, and by the absence of the acute keel at the periphery, &c.

Type from Bhamô, axis 6½, diam. 12½ mil.

HELIX (PLECTOTROPIS) TRICHOTROPIS, Pfr.

Helix trichotropis, Pfr., Zeits. Mal. 1850 (China); Conch.-Cab., pl. 134, fig. 9-10.

This species differs from *H. tapeina* by the shape being a trifle more trochoid, the apex more central, and the whorls more concave; the keel at the periphery is even more developed, and the aperture a trifle more produced laterally; a marked characteristic is the minute and close spiral sculpture of the base, which in *H. tapeina* and all its varieties is on the other hand distinctly though minutely granulose; it is principally on account of this last character that I prefer to class *H. trichotropis* as a distinct species, and not as a variety of *H. tapeina* (near *rotatoria* and *akoutongensis.*)

Major Godwin-Austen found an extremely interesting form in the Khasi Hills, with more depressed spire and thinner texture (axis 6, diam. 18 mil.); it is, I believe, one of these specimens that is represented in the Con. Indica (pl. 15, fig. 4) as *H. akoutongensis*, from Pegu. A few specimens were found by Dr. Anderson at the Second Defile, Irawady; they agree exactly with specimens in the Museum from Shanghai.

Specimen from 2nd Defile, Irawady, axis 6, diam. 15½ mil.

HELIX (PLECTOTROPIS) PERPLANATA, n. sp.

(*H. trichotropis*, var. ?)

Four specimens only of this very remarkable form were found at Mimboo, Upper Burma; a larger series is required to prove with certainty whether it be a distinct form, or only a variety of *H. trichotropis,* or of *H. tapeina* (near var. *rotatoria*).

After a most careful examination with a lens, I am unable to trace any sculpture whatever on the base; the seven whorls above are perfectly flat, as in the European *H. explanata;* the keel on the periphery and the shape of the aperture are about the same as in *H. trichotropis* (especially the Khasi form); the umbilicus, however, is considerably more open, quite twice as open as in the Chinese and the above recorded specimens, and about half as open again as in those from the Khasi Hills; the epidermis seems peculiar, having the appearance of being less close in texture and of a decidedly more developed character.

Axis 4½, diam. 17½ mil.

HELIX (PLECTOTROPIS) OLDHAMI, Bens.

Helix Oldhami, Bens.—A. & M. 1859, ser. 3, vol. III, p. 184; Con. Indica, pl. 15, fig. 7.

This species, well represented in the Con. Indica, is next allied to *H. catostoma* and to *H. tapeina;* the characters of the aperture distinguish it from the former, the very open umbilicus &c., from the latter. A single specimen was found at Ava, agreeing exactly with typical specimens from the Arakan Hills.

HELIX (PLECTOTROPIS) CATOSTOMA, Blf.

Helix (Trachia) catostoma, Blf., P. Z. S. 1869, p. 447 (Ponsee).
H. catostoma, Blf., Con: Indica, pl. 56, figs. 2, 3.

The specimen figured in the Con. Indica is not taken from a typical Yunnan specimen, but probably from one from Assam. The type in the Indian Museum, found at Ponsee on the First Expedition, is the only adult specimen as yet found in Yunnan; though, indeed, nine or ten immature specimens were also found, in none of which, however, are the characters of the lip developed. *H. catostoma* was found by Major Godwin-Austen and Mr. Robert tolerably abundantly in the Naga Hills, and it is probably one of these specimens that is figured as above in the Con. Indica; they only differ from the type form by the less depressed spire and slightly less open umbilicus; the characters of the aperture are the same, the dentiform process on the basal margin being equally developed and characteristic in both.

HELIX (PLECTOTROPIS) HUTTONI, Pfr., var. SAVADIENSIS nov.

Helix Huttoni, Pfr., Symb. II. (Landour, &c.)

The shell represented in the Con. Indica, pl. 15, fig. 8, is not, I think, a typical specimen from the North-West Himalayas, but rather a specimen from Darjiling; the former is a smaller, more rounded, and less solid shell, scarcely keeled at the periphery, with a higher spire and less produced aperture. A form found by Dr. Anderson abundantly at Ponsee and Ava is nearer the Darjiling form; the spire is slightly higher, with the apex more central. Seven specimens of a distinct and remarkable variety were also found at Sawady; at first sight these present a curious resemblance to *H. arakanensis*, and with that species are probably the connecting link between *H. tapeina* and *H. huttoni*, though unmistakably only a variety of the latter; var. *savadiensis* differs by its more raised spire, stouter texture and less open umbilicus. *H. winteriana*, v. d. Busch. (Java) seems to be a var. of *H. huttoni*, differing by its more open umbilicus.

Specimen from Darjiling, axis 5¼, diam. 12¼ mil.

Var. *savadiensis*, from Sawady, axis 7, diam. 12½ mil.

HELIX (PLECTOTROPIS) PHAYREI, Theob.

Helix Phayrei, Theob., J. A. S. B., 1859 (Ava); Con. Indica, pl. 1, fig. 15.

This is the largest species of the group, and is well figured in the Con. Indica; it appears to be rare, as three specimens from Ava are all there are in the Museum. It is next allied to typical *H. tapeina*, the umbilicus being exactly similar; the periphery, however, is merely angulate, not keeled;

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the sculpture above is considerably coarser and more developed, the columellar margin more oblique and slightly angulate at base, and the outer margin more produced and rounded.

HELIX (TRACHIA) DELIBRATA, Bens.

Helix delibrata, Bens., J. A. S. B., 1836 (Sylhet).
Helix procumbens, Gld., Proc. Bost. Soc. 1844 (Tavoy).

The types of this species from Sylhet are in the Indian Museum. It is a form with an unusually open umbilicus, a single spiral brown band, and a rather flat spire. Major Godwin-Austen has also presented similar specimens from the Khasi Hills. A closely allied form is abundant in Arakan and Bassein; this only differs by the umbilicus being a trifle less open; it is well represented in the Con. Indica, pl. 14, fig. 10. Close to both the preceding are six specimens found by Dr. Anderson at Bhamô, umbilicus like that of the type form, suture a shade more excavated, slightly smaller in size. Var. *fasciata*, Godwin-Austen, J. A. S. B. 1875, pl. 1, fig. 1, is abundant at Seebsaugor in Assam; it only differs by its colouration. For the shell figured in the Con. Indica, pl. 14, fig. 9, I suggest the name of var. *khasiensis;* the raised and rounded whorls, less open umbilicus, and contracted aperture well distinguish the form; it has sometimes a single brown band, but is oftener without it; it is tolerably abundant in the Naga and Khasi Hills.

Type of *H. delibrata*, from Sylhet, axis 7½, diam. 21 (apert. alt. 9, diam. 11 mil.).

Specimen from Bhamô, axis 6½, diam. 19 mil.

Var. *khasiensis*, from Khasi Hills, axis 8½, diam. 19½ (apert. alt. 9, diam. 10½ mil.).

Var. *fasciata*, G.-A., from Seebsaugor, axis 9, diam. 23¼ mil.

HELIX (GANESELLA) CAPITIUM, Bens.

Helix capitium, Bens., A. & M. 1848, ser. 2, vol. ii, p. 160 (Behar);
H. hariola, Bens., A. &. M., 1856, ser. 2, vol. xviii, p. 251 (Thayet Myo.)

There is no specimen in the Museum from Bengal of either of the shells called *H. capitium* or *H. hariola*, but I am informed by Mr. W. T. Blanford that he has in his collection specimens of typical *H. capitium*, from the Ganges Valley and from the Nullaymullay Hills in Southern India, and that he is convinced that the form in Upper Burma, first found by himself in 1861, cannot be distinguished. Morelet, Ser. Conch. IV, p. 254, 1875, records a most interesting locality for *H. capitium*, viz., Bangkok in Siam. On the other hand the Museum possesses both forms from Burma, from Prome the form figured in the Con. Indica, pl. 14, fig. 6, as *H. hariola*, and from Ava that figured on the same plate, fig. 5, as H. *capitium;* the latter Dr. Anderson also found at Kalawat in Upper Burma; the two forms seem to me perfectly identical, except that var. *hariola* is keeled at the periphery.

HELIX (DORCASIA) SIMILARIS, Fér.

Helix similaris, Fér. Prodr., 1821.

Found abundantly at Prome, Pagan, Bhamô, and Sanda, with and without the brown band at the periphery; specimens agree exactly with others in the Museum from Penang, Shanghai, and Thyet-Myo; specimens from Mauritius, Bourbon, Seychelles, and Brazil differ slightly, but most certainly belong to one and the same species.

Axis max. 9½, diam. max. 16½ (apert. alt. 8½, diam. 8½ mil.).

HELIX (DORCASIA) BOLUS, Bens.

Helix bolus, Bens., A. & M., 1856 (Prome).
H. tourannensis, Soul., Voy. Bonite., Pl. 29, fig. 1-2 (Cochin China.); Con. Indica, pl. 23, fig. 7.

Dr. Anderson found this species very abundant at Pagan, Upper Burma, and at Ponsee and Sanda in Yunnan; typical specimens from Prome are exactly similar; specimens of var. *tourannensis*, from Cochin China, only differ by the spire being slightly more raised.

HELIX (DORCASIA) ZOROASTER, Theob.

Helix zoroaster, Theob., J. A. S. B. 1856 (near Ava); Con. Indica, pl. 86, figs. 2, 3,

This species can be constantly distinguished from *H. similaris* by its larger and more depressed form, by the considerably more open umbilicus, the more angulate last whorl, and the more produced aperture, the columellar margin of which is much more oblique. It was found abundantly at Prome, Thyet-Myo, Pagan, Tsagain, and Manwyne.

Axis max. 9½, diam. max. 18¼ mil. (apert. alt. 9, diam. 10.)

HELIX (DORCASIA) SCALPTURITA, Bens.

Helix scalpturita, Bens., A. & M., 1859 (Ava); Con. Indica, pl. 53, fig. 9.

This fine species was found abundantly at Tsagain, Ava, Mandalay, and Second Defile, Irawady; it can be distinguished from both the preceding species by the rounded whorls and raised spire and by the height of the aperture; the brown band is almost always very distinct and richly coloured, in one or two specimens only is it obsolete. Though undoubtedly this and the two preceding forms are most closely connected, I consider all three at present as well-established species.

Axis. max. 13, diam. max. 21½ mil. (apert. alt. 11, diam. 11¾).

PUPA (CYLINDRUS) INSULARIS, Ehr.

Pupa insularis, Ehr., Symb. Phy. (Red Sea); *P. pulla*, Gray, P. Z. S. (Banks of the Ganges). *P. cylindrica*, Hut., J. A. S. B. 1834; *Bulimus insularis*, Ehr., Con. Indica, Pl. 22, fig. 10.

This, probably our commonest Indian land-shell, was found in great abundance at Pagan, Upper Burma; very curiously neither this nor the next species are found at all in the neighbourhood of Calcutta. The Museum possesses specimens from Aden, Gwadar, Abyssinia, Sind, Kutch, Suliman Range, Trichinoply, Ceylon, Poona, Burwani Hills, Tinali (Benares), and Saharunpur (N. W. Provinces). The Burmese localities of *P. insularis* and *P. cœnopictus* now recorded, I consider particularly important and interesting. Pl. 22, fig. 10 of the Con. Indica well represents the Burmese form.

PUPA (LEUCOCHILA) CŒNOPICTUS, Hutt.

Pupa cœnopictus, Hutt., J. A. S. B. 1834 (Agra).
Bulimus cœnopictus, Hutt., Con. Indica, pl. 23, fig. 9.

Found abundantly at Ava and Tsagain, Upper Burma; there are also specimens in the Museum from Erode, Cutch, Patna, Trichinopoly, Delhi, Quettan, Abyssinia, and Gwadar.

PUPA (SCOPELOPHILA) SALWINIANA, Theob.

Pupa salwiniana, Theob., J. A. S. B. 1870 (Shan States); Con. Indica, pl. 100, fig. 9.

I found a single specimen of this interesting shell inside a *Glessula obtusa* from Bhamô.

SUCCINEA ACUMINATA, Blf.

Succinea acuminata, Blf., P. Z. S., 1869, p. 449 (Ponsee); Con. Indica, pl. 68, fig. 7.

Found on the First Expedition only, at Momein in Yunnan; it is a well characterized and perfectly distinct species.

VERONICELLA, n. sp.

Two very fine specimens of an apparently quite new form were brought back from Ponsee, preserved in spirit; even in their present contracted state the bigger one is 93 mils. in length; I prefer not giving them a name at present, as I am not prepared to describe their anatomical characters.

VERONICELLA BIRMANICA, Theob.

Vaginulus Birmanica, Theob., J. A. S. B., 1864, p. 243 (Rangoon, &c.)

This species is not mentioned by M. Fischer, in his Monogr. of the genus, Nouv. Archiv, Vol. VII. Stoliczka gives further details concerning the form, J. A. S. B., 1871, p. 33. Dr. Anderson brought back eight specimens from Bhamô and Tonsine, preserved in spirit, of course; the largest measures 24 mils.

HELICARION RESPLENDENS, n. sp.

Shell in texture and colour resembling *Helic gigas*, Bens., but a little thinner and more membranaceous; it is at once distinguished from it by its flattened, more ear-like and appressed shape. It also somewhat resembles *Helic. Peguensis*, Theob., J. A. S. B. 1834, p. 8, from Prome; it is, however, a larger and thicker shell, with the whorls of the spire much broader and more distinct, and considerably less open at the base; in many respects it is intermediate between the above two species, though all three are easily recognisable and quite distinct.

Type of *Helic. resplendens*, diam. max. 22, lat. 14, crass. 8 mil.

Helic. gigas, (small specimen), diam. 22, lat. 16, crass. 10 mil.

Helic. Peguensis, diam. 17, lat. 10, crass. 5 mil. (a rather larger specimen than the type).

Four specimens of this interesting form were found at Sawady. Dr. Anderson also brought back a single specimen (in spirit) from Bhamô (5000 ft.) which clearly shows the animal to be of a light pinkish colour, very sparsely dotted with black specks, except on the mantle lobes and caudal extremity, which are thickly dotted; in this specimen the spire of the shell only is covered by the animal, though the mantle lobe has no doubt shrunk.

HELICARION GIGAS, Bens., var.

Vitrina gigas, Bens., J. A. S. B., 1836, p. 350 (Sylhet).

A single specimen was found at Kyoukphoo; though differing slightly, it is so close to the shell of typical *Helic. gigas*, that I think there can be little doubt of their identity.

Diam. 35½, axis 8½; apert. lat. 27½, alt. 21 mil.

HELICARION MAGNIFICUS, n. sp., G. A. and NEV.,

I am indebted to Major Godwin-Austen for pointing out that this magnificent slug, the largest yet known of the genus, is quite distinct from Benson's *Helic. gigas* (Khasi Hills); Godwin-Austen has kindly undertaken to describe the animal with full details and a figure, so that it is only necessary for me here to state that it is very closely allied to the Assam species, but that the shell is much larger, of a brown (not green) colour, with the body-whorl much more flatly expanded, and the spire less convoluted and more depressed, and that, looked at from underneath, very much less of the reflected body-whorl is visible.

The largest specimen, in spirit, measures 70 mils.

Shell, diam. maj. 46, axis, 11½; apert. lat. 40½, alt. 29½ mil.

Tolerably abundant at Momein in Yunnan, at 5,500 ft.

HELICARION VENUSTUM, Theob.

Vitrina (?) venustum, Theob., J. A. S. B. 1870, p. 400 (Arakan).

? *Helic. solidum*, G. A., P. Z. S., 1873 (Hengdan).

Dr. Anderson brought back, from Ponsee in Yunnan, numerous specimens (preserved in spirit) of a small form, the shell of which I am unable to distinguish from typical Arakan specimens of *Helic. venustum,* only differing in apparently being of a smoother and more polished texture and in the spire being a shade more distinctly convoluted; a single specimen of *Helic. solidum* from the Naga Hills is quite undistinguishable from the above Arakan specimens. The figures in the Con. Indica of the two forms are however so distinct that the types will have to be re-examined. Dr. Anderson also brought back a small specimen (in spirit) of apparently the same form from Nampura in the Kakhyen Hills, found under stones near running water; the animal of this specimen differs from that of my *Helic. resplendens* in apparently completely covering the shell and in being of a duskier, more uniform colouration, apparently not speckled at all, but of a darker tinge on the mantle lobes and caudal extremity than on the rest of the foot; this as far as it goes would seem to agree fairly with the original description of the animal of *Helic. solidum*, J. A. S. B. 1875.

HELICARION (CRYPTOSOMA) PRÆSTANS, Gld.

Vitrina præstans, Gld., P. Bost. Soc. 1843, p. 100 (Tavoy); Con. Indica, pl. 65, figs. 5, 6.

The entire shell is covered with a thick and compact brown epidermis; the largest specimen in the Museum, from Tenasserim, measures, axis 27½ diam. 31¼ mil. It is an extremely abundant species in Tenasserim, and also near Moulmein; Dr. Anderson found it abundant at Sawady and on the banks of the Irawady, Second Defile.

ENNEA (HUTTONELLA) BICOLOR, Hutt.

Pupa bicolor, Hutt., J. A. S. B., 1834 (Mirzapore); Con. Indica, pl. 100, figs. 4—6.

Fairly abundant at Bhamô. Both *E. mellita*, Gld., and *E. ceylonica*, Pfr., are undoubtedly merely varieties of this most widely dispersed shell.

STREPTAXIS THEOBALDI, Bens.

Streptaxis Theobaldi, Bens., A. & M. 1859 (Tefia Ghat); Con. Indica, pl. 8, fig. 8.

A few specimens were found at Bhamô, agreeing exactly with the typical Khasi-hill form.

STENOGYRA (OPEAS) GRACILIS, Hutt.

Bulimus gracilis, Hut., J. A. S. B. 1833 (Mirzapore); Con. Indica, pl. 23, fig. 4.

Found abundantly at Tsagain and Bhamô on the First Expedition.

GLESSULA OBTUSA, Blf.

Achatina (Glessula) obtusa, Blf. P. Z. S. 1869 (Bhamô); Con. Indica, pl. 36, fig. 6.

This fine shell was found only on the First Expedition at Bhamô.

GLESSULA SUBFUSIFORMIS, Blf.

Achatina (Glessula) subfusiformis, Blf., P. Z. S. 1869, p. 449 (Ponsee).

The single type specimen in the Museum, found on the First Expedition at Ponsee in Yunnan, remains unique; the species cannot be confused with any other of our Indian forms.

GLESSULA PYRAMIS, Bens.

Achatina pyramis, Bens., A. and M. 1860, ser. 3, vol. V, p. 463 (Teria Ghat); Con. Indica, pl. 18, fig. 6.

Several specimens were found at Ponsee in Yunnan which agree fairly with the typical Khasi form.

GLESSULA BLANFORDIANA, n. sp.

Shell resembling that of *G. Peguensis*, Blf., but rather more slender and of thicker texture, easily distinguished by the acutely raised undulating, perpendicular, and longitudinal striation.

Long. , diam. mil.

Two specimens only from Ponsee in Yunnan.

LIMNÆA ANDERSONIANA, n. sp.

Shell small, horny brown, imperforate, globose, spire short; whorls four to five, last whorl large, ovate; columella remarkably thick and reflected, straight, without any twist; aperture subovate, anteriorly rather wide.

This small species, well characterized by its remarkable columella, is unlike any Indian species; the figure that it most resembles in 'Küster's Monog.' is a var. of *L. peregra*, pl. 3, figs. 17, 18; there is no shell like it figured in the 'Conch. Iconica'; probably *L. andersoniana* will prove to be a common species throughont S. China.

The late Dr. Stoliczka has since collected a perfectly identical form at Yarkand, as well as a variety at Kashgar, the latter interesting as possessing a very small umbilicus; *L. andersoniana* appears to be next allied to *L. pervia*, Mart. (? = *L. Davidi*, Desh.) and will require further comparison with type specimens of the two latter.

Long. 10, diam. 6¼; apert. long. 7½, diam. 3¾ mil.

Abundant at Sanda and Nantin in Yunnan, at 4000 feet.

LIMNÆA YUNNANENSIS, n. sp.

Shell medium-sized, ovately oblong, imperforate, pale horn-colour, very fragile, spire acuminate; whorls three to four, last whorl remarkably small; columella very strongly twisted and much produced, aperture very elongate contracted anteriorly, broadly and beautifully regularly rounded at base.

This species is closely allied to the shell figured by H. Adams, 'P. Z. S.' for 1866, as *L. Swinhoei* from Formosa; it also resembles pl. 4, fig. 25*b* in the 'Conch. Iconica,' but not fig. 25*a*, which belongs apparently to a distinct species; *L. yunnanensis* may eventually prove to be an extreme variety of *L. Swinhoei*, characterized by the smaller body-whorl, by the aperture being more contracted anteriorly and more rounded posteriorly, finally by the slightly more twisted columella. I have little doubt that *L. swinhoei* itself is only a synonym of *L. flava*, Phil., Zeits. Mal. 1851, p. 78. (I. Liew-kieu); certain it is, that a shell sent me by M. Morelet, under the latter name from China, agrees exactly with Mr. Adams' figure in the 'P. Z. S.'; Sowerby in the 'Conch. Iconica,' in his usual careless and worthless style, records and figures a species as *L. flava*, Morl.?

Long. 16, diam. 10; apert. long. 11½, diam. 7 mil.

At Sanda in Yunnan.

LIMNÆA ACUMINATA, Lam., var. RUFESCENS, Gray.

Limnæa rufescens, Gray, Sowerby, Gen. Shells, pl. 7; Con. Indica, pl. 69, fig. 1.

A single specimen was found at Mandalay during the First Expedition.

LIMNÆA LUTEOLA, Lam., var.

Limnæa luteola, Lam., Anim. s. Vert., VI, pt. 2, p. 160; Con. Indica, pl. 70, figs. 5, 6.

Six specimens of a small variety were obtained at Mandalay with the preceding species.

PLANORBIS EXUSTUS, Desh.

P. exustus, Desh., Belanger, Voy. Ind. Orient., p. 417, pl. 1, figs. 11—13; Con. Indica, pl. 39, fig. 10.

Numerous specimens were obtained at Bhamô.

PLANORBIS COMPRESSUS ?, Hutt.

Planorbis compressus, Hutt., J. A. S. B., 1834, p. 91 (Mirzapore); Con. Indica, pl. 99, fig. 1.

Four specimens were obtained at Sanda in Yunnan.

CYCLOPHORUS SUBLÆVIGATUS, Blf.

Cyclophorus sublaevigatus, Blf., P. Z. S. 1869, p. 446 (Bhamô); Con. Indica, pl. 34, fig. 7.
Cyclophorus eximius, Con. Indica, pl. 33, fig. 1, (not *C. eximius*, Mouss.)

The Museum is indebted to Dr. Oldham for several fine specimens of a form of this handsome species collected in Assam by Mr. Masters; they agree exactly in every respect with the type form, having light yellow-coloured apertures, &c., only they are a trifle larger in size; it is probably one of these specimens which is figured in the 'Con. Indica,' pl. 33, figs.

1, 2 (Khasi Hills !); it differs widely from Mousson's Javan species, by the acutely angled periphery, by its much more open umbilicus, and by the broad basal band, &c. A large series of a fine variety of this species has also been presented to the Museum by Mr. S. E. Peal, from the Naga Hills; this variety is of a slightly less depressed form, the umbilicus a trifle less open, but its most marked characteristic is the more circular aperture, which is of a deep crimson colour; I suggest that this handsome form be known as *C. sublævigatus*, var. *Pealiana*, after its discoverer. *C. balteatus*, Bens., from Pegu, is an extremely closely allied species.

Type, from Upper Burma, axis 29, diam. 46 mil.

Large form from Assam, axis 31, diam. 57 mil.

Type of var. *Pealiana*, from the Naga Hills, axis 30, diam. 56 mil.

CYCLOPHORUS FULGURATUS, Pfr.

Cyclophorus fulguratus, Pfr., P. Z. S. 1852, p. 52; Con. Indica, pl. 3, fig. 3.
[Var.] *Cyclophorus patens*, Blf., J. A. S. B., 1862; Con. Indica, pl. 3, fig. 5.

This species was found in great abundance at Mimboo and Prome; *C. patens*, Blf., from Pegu I consider only a variety, distinguished by its rounder and more thickened whorls, and especially by the less open umbilicus; *C. fulguratus* is one of the commonest Burmese land-shells.

M. Morelet states (Ser. Conch. IV, p. 283), that it is also found in Siam.

CYCLOPHORUS ZEBRINUS, Bens., var.

Cyclophorus zebrinus, Bens.—J. A. S. B., 1836, p. 355 (Sylhet); Con. Indica, pl. 2, fig. 2.

Found in great abundance by Dr. Anderson at Bhamô, Hoetone, and Ponsee. It appears to be a variety of the common Khasi species, differing by its greater size and duller colouring.

SPIRACULUM ANDERSONI, Blf.

Spiraculum Andersoni, Blf., P. Z. S., 1869, p. 447 (Bhamô); Con. Indica, pl. 86, fig. 3.

The type specimens were found on the First Expedition at Bhamô, where the species was then very scarce; it was obtained again on the Second Expedition, living in tolerable abundance on the right bank of the Irawady, Second Defile, above the Great Cliff.

SPIRACULUM AVANUM, Blf.

Spiraculum Avanum, Blf. J. A. S. B., 1863, p. 319 (Ava); Con. Indica, pl. 134, figs. 7, 8.

A single specimen was found on the First Expedition at Bhamô, the species is quite distinct from *S. Andersoni*.

PTEROCYCLUS INSIGNIS, Theob., var.

Pterocyclos insignis, Theob., J. A. S. B., 1865; Con. Indica, pl, 5, figs. 6, 7.

Three dead specimens only of this interesting form were found on the First Expedition on the Kakhyen Hills; the spire is a trifle more depressed than in typical specimens from the Shan States.

PTEROCYCLUS FEDDENI, Blf.

Pterocyclos Feddeni, Blf., J. A. S. B., 1865, p. 93 (Thyet Myo); Con. Indica, pl. 134, fig. 1.

Tolerably abundant at Bhamô and above the great Cliff, Second Defile, Irawady.

ALYCÆUS AMPHORA, Bens.

Alycæus amphora, Bens., A. & M., 1856 (Moulmein, &c.); Con. Indica, pl. 91, figs. 2, 3.

A few small specimens of this widely distributed Burmese species were found at Bhamô.

BITHYNIA GONIOMPHALUS, Morl.

Bithinia goniomphalus, Morl., Rev. Zool. 1866, and Ser. Conch. III, pl. XIII, fig. 4 (Cochin China).

B. Iravadica, Blf., P. Z. S. 1869; Con. Indica, pl. 27, fig. 10.

A comparison of the type specimens in the Museum of *B. Iravadica* with typical specimens of *B. goniomphalus* from Cochin China (received from M. Morelet), prove the two species to be perfectly identical. Specimens from Siam of *B. Siamensis*, Lea (also received from M. Morelet), are exceedingly closely allied, and may prove to be only a variety; they differ, however, by their smaller size, and by the last whorl being rounded and not angulate, as is the case in *B. goniomphalus*. This species was obtained abundantly by Dr. Anderson at Ava, Mandalay, and Kabyuet.

BITHYNIA TURRITA, Blf.

Fairbankia ? (Bithynia) turrita, Blf., P. Z. S., 1869, p. 446 (Kyoutong).

This most distinct and interesting species was not found on the Second Expedition; the single type in the Indian Museum, therefore, remains unique. The species is, I think, a true *Bithynia*, certainly not a *Fairbankia*. It was found at Kyoutong in Upper Burma.

BITHYNIA MORELETIANA, n. sp.

In shape resembling *B. lutea*, Gray, (Con. Indica, pl. 37, fig. 7); spire peculiarly short, apex very obtuse and flattened, always eroded, but not decollated; whorls 3½, the last obliquely produced; always imperforate, both in very young and very old shells; margins of aperture entire, broadly reflected, produced and angled at base, outer margin rounded; epidermis dark olive-green; under the lens a minute spiral sculpture can be detected. Young specimens invariably show a sort of varix, formed probably at a period when their growth is arrested by some cause; this varix becoming absorbed in adult specimens. Above 200 specimens were found at Yaylay-maw.

Long. max. 8¾, min. 7¼, diam. max. 6, min. 7¾ mil; long. anfract. ult. 7; long. apert. 5¼, diam. 3 mil.

This species can easily be distinguished from the Indian *B. cerameopoma* and *B. lutea*: it is imperforate, has fewer whorls, a shorter and more obtuse spire, the columellar margin is less acutely angled at base, the epidermis green instead of brown.

MARGARYA, n. gen.

This remarkable shell is very difficult to classify, owing to its great analogy to two fresh-water genera, *Paludina* and *Melania*. I think, however, there is little doubt but that it will have eventually to rank as a subgenus of *Paludina*. *Margarya*, so named in honour of its discoverer, who unfortunately shortly after was murdered near Momein by the Chinese, is characterized by its produced, melania-like spire, composed of scalariform, rapidly increasing whorls, with very distinct suture; apex obtuse; sculptured with prominent spiral ribs; rimate (or umbilicate?); margins of aperture rounded, not continuous; animal and operculum unknown.

MARGARYA MELANIOIDES, n. sp.

Shell large, spire produced, melania-like, with very deeply excavated suture, apex obtuse; whorls six, convex, the first two flat and obtuse, the third large and tumid (bigger in proportion than the fourth); the four last whorls are girt with three nearly equally distant, raised, irregularly nodulose keels, the middle one much the largest, having its nodules more developed and of a more or less compressedly transverse shape; umbilicus very small, almost entirely covered by the reflected columella; aperture almost circular, nearly as broad as high; columella short, evenly rounded, moderately reflected over the shallow umbilicus; a slight callous between the columella and outer lip; remains of an epidermis distinctly traceable.

A broken specimen of four whorls only, long. 67, diam. 47; anfract. ult. 44; apert. alt. 28½, lat. 27½ mil.

A perfect, but not quite adult, specimen (6 whorls), long. 52, diam. 34; anfract. ult. 35½; apert. alt. 23 mil.

Four dead and water-worn specimens of this exceedingly interesting new form were picked up on the shores of Lake Tali in Yunnan by the late Mr. Margary and were given by him to Dr. Anderson, who has expressed his desire that the form should be named in honour of the unfortunate discoverer.

PALUDINA CHINENSIS, Gray, var. AMPULLIFORMIS, Sow.

Paludina Chinensis, Gray, Griff. An. K. 1834 (China).
P. lecythis, Bens., J. A. S. B., 1836 (Sylhet).
P. lecythoides, Bens., A. & M., 1842 (Chusan).
P. ampulliformis, Soul., Voy. Bonite, 1852, pl. 31, fig. 25—27 (Cochin China).
P. lecythis, Bens., var. *ampulliformis*, Eyd. and Soul., Con. Indica, pl. 77, fig. 7 (Upper Burma).

The types of Benson's *P. lecythis* are in this Museum ; they are a very large, globose, and thin form of *P. chinensis ;* pl. 76, fig. 6, in the 'Con. Indica' fairly represents Benson's form ; this variety has been recently rediscovered in India by Major Godwin-Austen, who found it at Munipur ; Benson's types of *P. lecythis* were more probably found in the same locality, than in Sylhet proper.

Found in great abundance, about 5000 ft. above the sea, at Nantin, Mungla, Momein, and Hotha in Yunnan ; there are two forms existing everywhere together which pass by insensible gradations the one into the other : one is a short tumid variety like typical *P. lecythis,* but of stouter texture and with the whorls much more distinctly angulate, appearing to me to be the form called *P. ampulliformis* by Souleyet : theother has a more produced spire, resembling that of *P. lecythoides ;* apparently both Yunnan forms can be distinguished from Chinese specimens by the markedly shorter last whorl, some one or two, however, show in this respect so close an approach to var. *lecythoides* that I am afraid the character cannot be relied upon to separate *P. chinensis* and its var. *lecythoides* from var. *lecythis* and var. *ampulliformis.*

PALUDINA DISSIMILIS, Müll., var. DECUSSATULA, Blf.

P. dissimilis, var. *ducussatula* (vel *P. decussatula*), Blf. P. Z. S. 1869, p. 445, (Ava).

Differs from *P. heliciformis,* v. Fr. by the less rounded whorls, by the more produced and not decollated spire, and by the less distinct angulation at the periphery, which is distinctly banded with a white belt, obsolete in the Pegu form. Both differ from typical Bengal *P. dissimilis* (*P. praemorsa,* Bens.) by the considerably more developed sculpture, more angular last whorl, less rounded aperture, and less open umbilicus, and by the more uniform green colouration ; the white belt is also less distinct than it is in most Bengal specimens ; it is even less like the South Indian var. *variata* and var. *obtusa.*

Common at Ava and Bhamô.

var. VIRIDIS, Rv.

P. viridis, Hanl. MSS., Rv., Con. Icon., fig. 20 [Loc. ?].

A fine striking form, easily distinguishable from the preceding by the more produced spire, obsolete belt, &c., exactly resembling the above figure of Reeve, but a trifle smaller. A few specimens only were found at Kabyuet.

Long. 29½, diam. 21 mil.

PALUDINA SIAMENSIS, v. Fr., var.?

Vivipara Siamensis, v. Fr., Zool.-bot. Ges., Wien, 1865, pl. 22, (Siam).

The Museum possesses a single typical specimen from Siam, which seems to present no distinctive characters, except in its greater size, from the numerous, but all unfortunately young, specimens found alive at the Second Defile of the Irawady and at Yaylaymaw.

PALUDINA BENGALENSIS, Lam., var. DOLIARIS, Gld.

Paludina bengalensis, Lam., var. *digona*, Blf., P. Z. S., 1869, (Bhamô.)
P. doliaris, Gld., Proc. Bost. Soc., vol. I. p. 144.

Countless varieties of this well known shell are to be found everywhere throughout the Indian region. The form from Bhamô, called var. *digona* by Mr. Blanford, the type of which is in the Museum, is very incorrectly figured in the 'Con. Indica,' pl. 115, fig. 7, the characteristic angulation of the last whorl not being shown; it is apparently the widest spread variety of all; in the Museum are specimens almost undistinguishable from one another from Calcutta, Mandalay, and Siam (received from Morelet as "*P. lineolata*, Mouss."). A small and less angular form of var. *digona* was obtained at Myadong, having the last whorl more produced and separated. Another form sent me by M. Morelet from Cochin China as "*P. polygramma*, Mart.", is also found in Pegu and Calcutta. An interesting form near var. *digona* was found at Shuaygoomyo: it differs by the remarkably developed transverse sculpture, by the peculiar green of the epidermis, which has less of a yellow tinge, and by the umbilicus being more open than in any other specimens I have seen of this protean shell; this form is near *P. oxytropis*, Bens. (Con. Indica, pl. 76, fig. 5) from Munipúr, though the latter I consider a good and distinct species. Since the preceding was written, M. Morelet has suggested (Ser. Conch. IV, p. 306), that probably both *P. polygramma* and *P. lineolata* are merely varieties of *P. Bengalensis;* he states that both forms are found in Cochin China, and he identifies the two former for certain as merely varieties of *P. sumatrensis*, Dkr., Mal. Bl. 1852.

MELANIA (STRIATELLA) TUBERCULATA, Müll.

Nerita tuberculata, Müll., Hist. Verm.. p. 191, (Coromandel).

Two forms of this very common and variable shell were found abundantly in the old channel of the Irawady at Myadoung; the commoner of the two somewhat resembles pl. 74, fig. 1, of the 'Con. Indica,' but is more richly coloured, with the brown band at base remarkably broad and distinct; the whorls are a little narrower and more produced, the transverse ridges very acute and prominent, the longitudinal ribs nearly, or altogether, obsolete on the last two or three whorls; the upper two or three whorls are, as usual, decollated.

Long. max. 27½, diam. 9 mil.

The other form is shorter and more rounded, of a pale green, with scarcely any brown spots or markings and with the basal band nearly, or altogether, obsolete; the transverse ridges are irregular and less acute, the longitudinal ribs, on the contrary, strongly developed, becoming obsolete only below the middle of the last whorl; decollated like the preceding.

Long. max. 20, diam. 8 mil.

MELANIA (MELANOIDES) JUGICOSTIS, Bens.

Melania jugicostis, Bens. MS., Con. Indica, pl. 110, figs. 8, 9. (Tenasserim Rv.).

Unfortunately, only two specimens of this interesting species were brought back by Dr. Anderson; they were found at Myadoung with the preceding and following species. The species seems to me to belong rather to *Melanoides* than to *Plotia;* it certainly a good deal more resembles the Chinese *M. cancellata*, Bens., than *Plotia scabra;* in either case it is a very distinct and well characterized species, and is admirably figured in the 'Con. Indica.' Shell small, slightly decollated; whorls five, abruptly angular, smooth and shining, with a few rather distant, somewhat obsolete and irregular, transverse ridges on the lower half of the last whorl; longitudinally angularly ribbed, ribs very distant, thick and prominent, almost varicose, eight of them on the last whorl, disappearing towards the base; very pale green, with no markings except a subobsolete brown band at base.

Long. 12, diam. 6 mil.

MELANIA (MELANOIDES) IRAVADICA, Blf.

Melania Iravadica, Blf., P. Z. S., 1869; Con. Indica, pl. 71, fig. 1.

This seems to me to be the Upper Burmese form of a shell described by Gould as *M. baccata*, Proc. Bost. Soc., 1847. Mr. Theobald has presented a series to the Museum from the Upper Salween River; well figured in the 'Con. Indica,' pl. 75, figs. 3, 11 and by Brot in the 'Conch. Cabinet,' pl. 9, fig. 6; at first sight they seem to differ considerably from the form described as *M. Iravadica;* there is scarcely, however, any real difference, except the larger size and more distinct sculpture of typical *M. baccata*, which has three rows of nodules, the upper one of which is altogether obsolete in *M. Iravadica;* in one or two specimens, however, of the former this row is also obsolete. The type specimens of *M. Iravadica* are in the Indian Museum.

Typical *M. baccata*, of three whorls only, long 38½, diam. 20 mil.

M. Iravadica, from Yaylaymaw, of three whorls only, long. 30, diam. 17 mil.

At the latter locality the species was found in great abundance by Dr. Anderson on the Second Expedition, as it was also on the First Expedition at Bhamô and Manwyne; the small specimens, so well figured by M. Brot (Matér. Mél. iii, pl. 4, figs. 12—13) were from the latter locality; these specimens had been given in exchange by the Museum to the late Dr. Stoliczka, by whom they were sent to M. Landauer.

MELANIA (MELANOIDES) REEVEI, Brot.

Melania (Melanoides) Reevei, Brot, Matér. Mél. i., p. 46 and Conch. Cab., pl. 11 fig. 4.
M. balteata, Rv., pl. 20, fig. 144 B (not of Phil.).

A rather young specimen of this very distinct species was well figured as above by Reeve; an adult specimen of the same species is figured in the 'Con. Indica,' pl. 72, fig. 3. It is a well characterized species, quite distinct from *M. variabilis*, *peguensis*, and *gloriosa*, and of these three it is nearest allied to the last. There are specimens in the Museum from Noungbenzick in Pegu; it was also obtained plentifully at Mandalay on the First Expedition, and on the Second Expedition at Myadoung.

var. IMBRICATA, Hanl.

Melania Reevei, var., Brot., Conch. Cab., pl. 11, fig. 4 A.
Melania Reevei, var. *imbricata*, Con. Indica, pl. 153, fig. 4.

About twelve specimens of this variety were obtained at Yaylaymaw. It can be easily distinguished from the type form by its more developed sculpture; it has the same characteristic regular transverse ridges below the suture (four or five in number), but in addition has throughout other interrupted transverse ridges, broader than those near the suture and wider apart; it has also numerous longitudinal ribs, possessing a tendency at times to become obsolete (varying much in this respect in individual specimens), these ribs commence at the termination of the sutural row of regular transverse ridges, and are generally distinct only on the last few whorls; the columella is stained a rich brown colour.

Var. *imbricata*, of nine whorls, long. 65, diam. 26 mil.

MELANIA (PLOTIA) SCABRA, Müll.

Buccinum scabrum, Müll., Hist. Verm., p. 136 (Coromandel); Con. Indica, pl. 73, figs. 1-4.
Melania scabra, Müll.

A few specimens were found at Myadoung; they agree perfectly with Reeve's fig. 156 B (*M. spinulosa*, Lam.).

PALUDOMUS ANDERSONIANA, n. sp.

Large and globose; spire produced and pointed; of a very striking greenish yellow colour, with four intense black bands on the last whorl, the one at the suture and the two near the base about the width of the broadest band on *P. ornata;* the second band from the suture twice this width, this latter, in all but very old specimens, is very distinctly visible within the aperture; whorls seven, the first two or three generally decollated, transversely superficially ridged, ridges more or less obsolete towards the centre of the upper whorls, one of them below the suture more prominent than the rest; columella pure white; the operculum constantly differs on its inner side from those of the other Burmese species by the remarkably raised and very rugose nucleolar portion and by the distinct, though minute, granular margin. Dr. Anderson obtained several hundred specimens in all stages of growth at Mandalay, Ava, Bhamô, Kabyuet, and Myadoung. One of the best distinguishing marks from its var. *Peguensis* is the great width within the aperture of the second brown band; the band nearest the base, on the other hand, is comparatively smaller; in *P. Peguensis* (even in young specimens) the two upper bands are altogether wanting, the third very narrow, the last broad and diffused over the basal portion of the columella. This is probably the *Paludomus* sp. of Theobald from the Shan States, J. A. S. B., 1865, p. 264.

Long. max. 29, diam. max. 22 mil.

Var. PEGUENSIS (an sp. n.?)

Paludomus regulata, Bens., var., Con. Indica, pl. 108, fig. 6.

Differs from the preceding by the slightly more rugose sculpture, by its more decollated apex, by the less cylindrical whorls and less produced and pointed spire (more apparent in young specimens), by the columella being apparently invariably faintly stained with brown, by the almost entire apparent absence of colouration on the last whorl, especially in the absence of the second broad band within the aperture. Unfortunately, all the specimens have lost their opercula. The specimen figured in the 'Con. Indica' is a very old decollated one.

Type of variety from Pegu, long. 21, diam. 16 mil.

PALUDOMUS ORNATA, Bens.

Paludomus ornata, Bens., A. & M., 1856, 498; Con. Indica, pl. 108, fig. 8.

Specimens of this very handsome species from Ava, Pegu, and Mandalay are in the Museum Collection; it is well characterized by its seven produced and solid whorls, acute and prominent spire; the Ava specimens are not decollated, though quite adult; those from the other two localities have, however, all lost their first three or four whorls; both young and old shells are perfectly smooth, with the exception of a deeply incised spiral groove below the suture; the figure in the Con. Indica, pl. 108, fig. 8, is excellent; perhaps it scarcely shows sufficiently clearly the three broad spiral brown bands; from the peculiar thickness, even of young shells, these bands are, however, often scarcely visible; the operculum resembles that of *P. regulata*, Bens., only it is little flatter, both differ considerably from that of *P. Andersoniana*, being much smoother on their inner side.

Long. 24, diam. 16 mil.

PALUDOMUS REGULATA, Bens.

Paludomus regulata, Bens., A. & M., 1856, p. 496; Con. Indica, pl. 108, fig. 5.

This species was not obtained by Dr. Anderson; the Museum, however, possesses some hundred specimens from Prome and Thyet-Myo in Pegu; the specimens from the latter locality are typical ones from the collection of Mr. Theobald; the shell is admirably figured as above in the 'Con. Indica'; the spiral, broad, flattened ridges throughout are very characteristic, as is also its slightly compressed, angular shape; the operculum differs from that of *P. Andersoniana*, by being more concave and less broad on its inner side, the nucleolar part is less raised and much more rugose, the broad polished margin (under the lens) is destitute of sculpture, instead of being minutely granular.

Long. max. 24½, diam. 16 mil.

PALUDOMUS BURMANICA, n. sp.

Shell small, very thick, spire depressed, in shape closely resembling the European *Litorina obtusata;* only two whorls, the others decollated in both young and old specimens; smooth, with a few irregular striæ at suture; columella very thick, pure white; aperture somewhat compressed, as in typical *P. labiosa*, not globosely expanded as in *P. Blanfordiana;* in all the ten specimens found, only three instead of four bands, the upper one exceedingly broad, covering nearly half the last whorl, the middle one narrow, the basal one broad, but not diffused over any part of the columella, these bands are of the most intense black within the aperture, even in very old, thick specimens; epidermis unusually thick, dark olive-green, closely covered with regular raised pustules of a lighter colour.

Yaylaymaw and also Mandalay.

Long. 14½, diam. 12 mil.

The operculum is like that of *P. regulata*, a shade darker in colour, nucleolar portion on the inner side a little more distinctly spirally rugose. The broad and richly coloured bands (only three in number), pure white columella, and peculiar epidermis are the principal distinguishing characters from typical Tenasserim *P. labiosa;* it is, I consider, quite distinct from *P. Blanfordiana*.

PALUDOMUS BLANFORDIANA, n. sp.

Paludomus labiosa, Con. Indica, pl. 108, fig. 9, (not of Bens.) "Tongoop."

There are good many specimens in the Museum from Pegu and Ava, also from Gowhatty in Assam, agreeing exactly with the shell figured as above in the 'Con. Indica'; there are also seven typical specimens of *P. labiosa*, collected by Mr. Theobald in Tenasserim; these latter are a good deal smaller and less angularly globose than the Pegu species, their columella is more vividly stained with brown, the brown bands are less regular and distinct (showing in an especially marked way within the aperture), and finally both young and old specimens are truncated, which is apparently never the case with the former; the sculpture of both is the same, quite smooth, except for a few irregular spiral striæ below the suture; the typical specimens of *P. labiosa* are without opercula; those of *P. Blanfordiana* resemble opercula of *P. regulata*, though they are even less rugose, the spiral striæ of the nucleolar portion of the inner side being distinct and regular (seen through the lens).

P. labiosa from Tenasserim, long. max. 12½, diam. 10;
P. Blanfordiana, type from Ava, long. max. 19, diam. 15 mil.;
P. Blanfordiana, var. from Assam, long. 20, diam. 15 mil.

This species resembles as closely *P. ornata* as it does typical Tenasserim *P. labiosa*; specimens from Assam differ in no respect from Burmese ones, except by the spire being a trifle more produced, this locality for the species is interesting, it appears to be very abundant there.

AMPULLARIA THEOBALDI, Hanl.

A. Theobaldi, Blf., Con. Indica, pl. 115, fig. 2, (Loc. ?)
? *A. maura*, Rv., var., Con. Icon. fig. 57 (Loc. ?)

Unfortunately none of the 16 specimens collected by Dr. Anderson at Bhamô are quite full-grown, the outer lip in all of them being thin and sharp; in the depression of the spire they agree with Reeve's figure of *A. maura*, as well as the typical figure of *A. Theobaldi;* the umbilicus is open, agreeing exactly with the latter figure; the colouration and shape of the aperture are also the same; I think it very doubtful, however, if it can be separated as a distinct species from the common Assam form, from which it only seems to differ by its larger size, less produced spire, slightly more open umbilicus, and in the colouration being a shade more vivid; in the latter two respects, however, some few Assam specimens approximate most closely.

UNIO MARGINALIS, Lam., var. SAVADIENSIS, nov.

Unio marginalis, Lam., Anim. s. Vert.; Con. Indica, pl, 9, fig. 6, (sp. juv.)

This variety is abundant at Sawady in the Thengleng stream, also at Bhamô and at Shuaygoomyo; four young specimens found at Myadoung probably also belong to this form. The nearest figured variety is *obesa*, Hanl., Con. Indica, pl. 44, fig. 7, from the Irawady; var. *savadiensis* is of a more ovate shape, of a slightly thinner texture, the nacre is of a light salmon- or cream-colour, instead of the ordinary bluish white tinge characteristic of var. *obesa*, the difference of colour in the nacre is constant both in young and old shells; the lateral teeth are more convex, the cardinal ones a little less strongly developed; young specimens of both varieties are prominently winged, as in var. *lamellatus*, pl. 44, fig. 7, of the Con. Indica; externally young specimens are of a gamboge-yellow colour, tinged with bright green on the wing.

Long. max. 113, lat. max. 68 mil.

var. CORRIANUS, Lea.

Unio Corrianus, Lea, Trans. Am. Phil. Soc. V., pl. 9, fig. 25;
U. marginalis, var. *Corriana*, Con. Indica, pl. 44, fig. 4.

Four magnificent specimens of this very marked variety were found at Yaylaymaw; the nacre is of the most beautiful salmon-pink colour; the only difference from typical Bengal specimens is that the texture and teeth are thicker, and this is the case also with specimens from Pegu.

Long. 115, lat. 55 mil.

UNIO FEDDENI, Theob.

Unio Feddeni, Theob., J. A. S. B. 1873, pl. 17, fig. 3.

Tolerably abundant in paddy-swamps at Bhamô, also at Yaylaymaw. I feel quite sure that Mr. Theobald is wrong in recording this species as found in the Pemgunga, Central India; typical specimens from Mr. Fedden are marked in the carefully kept collection of Mr. H. F. Blanford as from Burmah; the specimens found by Dr. Anderson in Upper Burmah confirm Mr. Blanford's record of the locality of the original type form, as opposed to that given by Mr. Theobald; Mr. Fedden collected in both localities.

UNIO BURMANUS, Blf.

Unio Burmanus, Blf., P. Z. S., 1869, p. 450 (Bhamô); Con. Indica, pl. 42, fig. 1.

This form was not found on the Second Yunnan Expedition. Full-grown shells are narrower and more produced, with the umbones much less prominent, and the rugose sculpture also less developed than is the case with *U. Bhamoensis*.

The types of *U. Burmanus* from Bhamô are in the Indian Museum.

UNIO BHAMOENSIS, Theob.

Unio Bhamoensis, Theob., J. A. S. B., 1873, p. 207, pl. 17, fig. 1.
Unio Mandelayensis, Theob., J. A. S. B., 1873, p. 208, pl. 17, fig. 2.

Not uncommon at Myadoung and Yaylaymaw; found also on the First Expedition at Mandalay, Bhamô, and Shienpagah. The two above forms can certainly not be separated, as indeed might have been surmised from Mr. Theobald's remarks in the original description, large series from one locality showing that both varieties run one into the other. The Pegu form mentioned in the original description of *U. Bhamoensis* differs a good deal more from both than the Bhamô from the Mandalay one; it is a pity Mr. Theobald did not give this Prome variety a name, instead of the Bhamô one.

UNIO FRAGILIS, n. sp.

? *Unio foliaceus*, Gld., Proc. Bost. Soc.; Con. Indica, pl. 42, fig. 3.
? *U. Peguensis*, Anth., Am. J. Con., pl. 25, fig. 2.

Ten specimens from Yaylaymaw only differ from the Pegu form, in that the epidermis, except on the posterior angle, is quite smooth; unfortunately they all seem young shells; the two biggest are exceptionally tumid, in this respect differing from the others, as also from the Bhamô and Sheinpagah specimens; in all of the above the nacre is less yellow-tinged towards the umbones, and the teeth thinner than in *U. foliaceus*. It is a form extremely close to, if not identical with, the *U. comptus*, Desh. (Nouv. Archives X, Pl. 6, fig. 3—4), stated by MM. Crosse and Fischer to be the *U. Sumatrensis* of Lea.

Type of *U. fragilis* from Yaylaymaw: long. 34, lat. 17½, crass. 11¼ mil.

Three specimens from Bhamô, all young: long. max. 43, lat. 24, crass. 13 mil.

Thirty specimens from Shienpagah, all young: long. max. 32, lat. 17, crass. 9¼ mil.

Specimens of *U. foliaceus*, from Pegu, long. 58, lat. 22, crass. 17 mil.

UNIO PUGIO, Bens.

Unio pugio, Bens., A. & M., 1862, p. 193; Con. Indica, pl. 10, fig. 7.

Abundant at Myadoung, Bhamô, and Yaylaymaw. Very young specimens are rugose anteriorly, especially near the umbones.

Long. 57, lat. 27, crass. 20 mil.

UNIO BONNEAUDI, Eyd. & Soul., var.

Unio Bonneaudi, Eyd. & Soul., Mag. de Zool., 1838, pl.; Con. Indica, pl. 10, fig. 6, and pl. 46, figs. 5, 6.

Very abundant at Myadoung, Irawady Second Defile, Shuaygoomyo, Yaylaymaw, and Bhamô. It varies considerably in being more or less rugose in sculpture.

Long. max. 52, lat. max. 29, crass. 24 mil.

UNIO ANDERSONIANA, n. sp.

This species was found at Myadoung in tolerable abundance, together with *U. Bonneaudi* and several other species; two specimens were also obtained on the First Expedition at Shienpagah. It is next allied to *U. pachysoma*, Bens., and to some of the varieties of *U. cæruleus*, Lea. It is easily distinguished from *U. Bonneaudi* by its more irregular shape, thinner texture by the acute angulation, greater production posteriorly, and by the more developed sculpture; a constant character also is the pink colour of the nacre, which in *U. Bonneaudi* is bluish white, this is equally distinct and characteristic in young as in old specimens.

Type from Myadoung, long. 32, lat. 15½, crass. 11¾ mil.

Specimen of *U. Bonneaudi* from Myadoung, long. 31, lat. 18, crass. 13 mil.

CORBICULA LAMARCKIANA, Prime.

Corbicula Lamarckiana, Prime, Ann. Lyc. N. York, 1867 (Mt. Laos, Cambodia).

Specimens obtained at Hotha and Momein (5,500 feet) in Yunnan, and also at Mandalay, agree exactly with Prime's original figure. Major Godwin-Austen also found a small form of this well-marked species at Manipúr, in the Kuchai stream.

Long. 28½, lat. 20½, crass. 13 mil.

CORBICULA YUNNANENSIS, n. sp.

Medium-sized specimens from Yaylaymaw agree fairly with Prime's figure and description of *C. Linneana*, (Ann. Lyc. N. York, 1867, Cambodia), the principal difference being the less truncate anterior side. Shell large, thick, transverse, inequilateral, compressed, rather abruptly tumid towards the umbones; anteriorly moderately produced and rounded, posteriorly produced and truncate (exactly as in Prime's figure of *C. Linneana*); lateral teeth curved, the anterior a little more so than the posterior; no lunule; epidermis dark brown, striæ regular and close; interior violet, of a darker shade near the margin. This species is more inequilateral, more tumid near the umbones, and more regularly sulcated than *C. Mülleriana*, Prime (*loc. cit.*), from China, which, however, it also closely resembles.

Type from Manwyne in Yunnan (4,000 feet): long. 39, lat. 33 mil.

Yaylaymaw (all young): long. 21½, lat. 17, crass. 11½ mil.

CORBICULA ANDERSONIANA, n. sp.

Rather small, thin, subequilateral, transversely ovate, tumid; medium-sized specimens closely resemble in shape *C. inæquilateralis*, Prime, both sides are obtusely rounded, epidermis bright green, interior violet, paler near the margin. This species is quite distinct from the other Burmese and Indian ones, it is, however, exceedingly close to *C. tumida*, Desh., P. Z. S., 1854, from Borneo, as figured by Issel.

Type from Momein in Yunnan: long. 20½, lat. 12 mil.

IV.—*Descriptions of three new Species of Birds of the Genera* Pellorneum, Actinura, *and* Pomatorhinus; *lately collected in the neighbourhood of Saddya, Assam, by* MR. M. J. OGLE *of the Topographical Survey.—By Major* H. H. GODWIN-AUSTEN, *F. R. G. S., F. Z. S., &c.*

(Received March 29;—Read April 4, 1877.)

1. PELLORNEUM PECTORALIS, n. sp.

Desc.—Head to nape dull dark chestnut; back, wings, and tail umber-brown, the last indistinctly barred and with narrow pale tips, the outer primaries edged paler. Lores and frontal feathers pale, tipped with pale black, extending as an obscure supercilium to the nape, where the feathers become broadly dingy white on their upper web, dark brown on the lower, those on the back of the neck are broadly black-centred. The ear-coverts are umber-brown, darker behind, forming a crescentic margin again bordered lighter. The chin is pure white for three-quarters of an inch; a dark gorget of broadly black-centred feathers then crosses the upper breast, the centering of the feathers becoming very large, oblong, and conspicuous on the elongate feathers of the sides of the neck, but paler and less defined on the flanks. From the gorget all beneath is pale rufescent ochre. The under tail-coverts are dark, bordered with white.

Legs pale ochre. Irides vermilion.

	Wing.	Tail.	Tarsus.	Bill at front.
♂	3·0″	3·0″	1·12″	0·70″
♀	3·0	3·0	1·0	0·63

HAB.—Saddya, Assam (M. J. Ogle).

This species is nearest and closely allied to *Pellorneum Mandellii*, W. Blanford, described from Darjeeling, which is the same as Hodgson's *P. Nipalensis*, a MS. name never published. It is a larger bird as regards wing, and the legs are more robust. The principal difference lies in the far larger extent of the dark streaking on the sides of the neck: the dark centred feathers are longer and broader than in *P. Mandellii*, the black oblong spots being 0·4 in. by 1·3 in. in this new form as against 0·3 by 1·0, while those on the upper nape are bordered with white above; the top of the head is dark chestnut, opposed to a dull rufous umber in the Darjiling species. Yet the greatest departure is in the abrupt termination of the white chin, succeeded by the ochraceous tint of the rest of the under parts, while the black centerings of the feathers are so broad and closely distributed as to form a decided dark gorget, whence they spread away down the sides of the breast. The feathers of the head and nape are more lengthened and fuller than in the other species.

We appear to have in this genus—all near allies:—

1. PELLORNEUM RUFICEPS,* Swainson.

South India.

2. PELLORNEUM MANDELLII, W. Blanford.

Sikkim, and the Garo and Khasi Hills.

3. PELLORNEUM PECTORALIS, G-A.

Eastern Assam.

4. PELLORNEUM TICKELLII, Blyth.

P. minor, Hume, S. F., 1873, p. 298, from Tenasserim.

P. subochraceum, Swinhoe, A. M. N. H., 1871, p. 257, also from Tenasserim.

Burmah and Tenasserim.

I cannot help thinking that the two last names are only synonyms. In the list of Birds from Tenasserim (Stray Feathers, Vol. II. p. 476.), the very country whence Tickell sent his specimens to Blyth, *P. minor* is recorded as common, but *P. Tickellii* as not yet obtained. Comparing specimens lately received from Tenasserim with the original description and with a specimen in the Indian Museum (also from Tenasserim) which there is every reason for believing to be one of the original types, I can arrive at no other decision but that *P. minor* and *P. subochraceum* are nothing else than *P. Tickellii*; nor is it likely that two distinct species whose dimensions are so exceedingly close are to be found in so limited an area.

2. ACTINURA OGLEI, n. sp.

Desc.—Above rich umber-brown with a sienna tinge, strongly rusty on the head and nape, the soft feathers of the back and rump are very finely and indistinctly crossed with narrow bars. A well-developed frontal band of white having the shafts of its feathers black, merges into a well-defined pure white supercilium and is continued over the black ear-coverts and down the side of the neck, where the white feathers become bordered with black, the supercilium thus terminating in scattered spots. This white supercilium is bordered above with black. Lores dark, chin pure white, breast grey, flanks and abdomen dull earthy brown. Wings and tail rich umber narrowly barred with black-brown, the tail having about 24 such bars. Irides crimson lake; legs and feet umber-brown.

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* Is given in Blyth's List of the Birds of Burmah, but I doubt if true *P. ruficeps* is found out of Southern India.

Length about 6″, wing 2·8″, tail 2·8″, tarsus 1·1″, bill at front 0·60″.

The bill, which is stronger and deeper than in any other species of the genus, is black above, grey below.

HAB.—Shot on Manbúm Tila, on the Tenga Pani river, near Saddya, at 800 ft. (M. J. Ogle).

This is another new form for which we have to thank Mr. Ogle, after whom I have much pleasure in naming it. It is one of the most beautiful and distinct forms of the genus, its white chin and superciliary stripe being a most conspicuous departure from the type of coloration possessed by the other species.

Actinura Oglei in the coloration of the head and nape, and in its white throat, has remarkable affinities for *Turdinus guttatus*, Tickell, from Tenasserim. This last bird can hardly find a place in the genus *Turdinus* as exemplified by such forms as *T. brevicaudatus* and its allies. In the stout legs and feet it is akin to *Actinura*, and in the form of the nostrils it is also like *Actinura Oglei*. The principal departure to be noted is in the absence of barring on the wings and tail, but this is to be discerned, though it is indistinct, and is noted by Tickell in his original description, when the barring was no doubt more apparent than it now is in the faded type specimen in the Indian Museum, Calcutta. In *A. Oglei* this barring, I notice, is far less conspicuous than in *A. Egertoni*, *A. Waldeni*, &c. Altogether these two birds present a most instructive case of close generic relationship.

3. POMATORHINUS STENORHYNCHUS, n. sp.

Desc.—Above pale umber-brown with an ochraceous tinge, richer brown on the head, a more umber tint on the tail and wings, a narrow pure white supercilium from base of bill over the eye to the ear-coverts, but not extending further. Lores black, passing under the eye to the ear-coverts, which are grey-black and bounded posteriorly with rufous brown. Chin and upper throat pure white, breast and abdomen pale rufescent, flanks and under tail-coverts pale ochraceous brown.

Bill very long, tapering, curved, and much compressed; bright orange-red. Legs and feet horny grey.

♂ Length abt. 8″; wing 4″ ; tail 4·4″; tarsus 1·35″; bill at front 1·45″,
♀ „ 3·25; „ 3·9; „ 1·20; „ 1·15.

The female is thus very decidedly smaller than the male.

HAB.—Obtained on Manbúm Tila, on Tenga Pani River, near Saddya at 800 ft. (M. J. Ogle).

This beautiful *Pomatorhinus*, which with the preceding species was discovered during the past cold season, in its very slender and narrow bill approaches the *Xiphorhamphus* form more than any other species of this group of Scimitar Babblers. In its coloration it reminds one of *Pom. ferruginosus.*

The claw of the inner toe is smaller than the outer, and all the claws are rounded off at the tip so as to have a peculiarly blunt gouge-like appearance.

The collection also contains several other new and interesting species, some of which I am unable to determine satisfactorily out here, but which shall be described in more detail in my next List of Birds from the N. E. Frontier. I may mention (i) an *Abrornis* with yellow chin, which I propose naming *A. flavogularis;* (ii) *Chleuasicus atrosuperciliaris*, intermediate in size between *Paradoxornis ruficeps* and *Ch. ruficeps;* (iii) *Horornis fuliginiventer*, Hodg.; (iv) *Turdinus Williamsoni* quite distinct from the type of *T. brevicaudatus*, Blyth, which is of a strong rufous colour on the breast, abdomen, and under tail-coverts; this rufous colour pervades the back, and the spotting on the secondaries is smaller and less conspicuous than in the specimen lately received from Saddya.

* * *

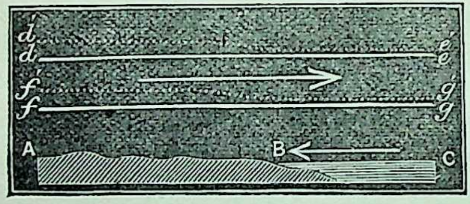
V.—*Note on the Variation of the Barometric Tides in connection with Diurnal Land- and Sea-Breezes.—By* Henry F. Blanford, *Meteorological Reporter to the Government of India.*

(Received January 29 :—Read March 7, 1877).

The theory of the diurnal land- and sea-breezes on sea-coasts is perhaps one of the most familiar of meteorological topics, and the subject finds a place in all our handbooks of meteorology and physical geography, as an illustration of winds of convection. It has long been surmised, as a deduction from the theory, that the daily oscillations of pressure over the sea and the land, in the neighbourhood of coast-lines, must shew marked differences; the pressure being higher over the land during the night and early morning, over the sea during the afternoon and evening hours. Hitherto, however, as far as I am aware, this inference has never been confirmed by the results of actual observation; and the following facts, relating to the diurnal variation of pressure over the head of the Bay of Bengal between 60 and 120 miles from the coast of the Súnderbans, will therefore have that interest which must always attach to the confirmation of a familiar theory. At the same time, I may point out, the view which I put forward at a recent meeting of the Society, *viz.*, that a considerable transfer of air takes place in the day-time from the land to the sea, also receives confirmation; and, regarded as a whole, the resulting phenomenon is, to my mind, a very beautiful and at the same time simple solution of a problem in meteorological physics.

The data which have given occasion to this communication have reached me only within the last few weeks. They are the reduced logs, relating to Indian seas, for the month of January, which have been accumulated for many years past by the London Meteorological Office, established by the late Admiral Fitzroy, and now under the direction of Mr. R. H. Scott and Captain H. Toynbee. The observations have all been made with compared instruments and have been corrected to the Kew standard; and the extracted observations have been carefully sifted in the course of extraction, and all doubtful entries rejected. Those which I shall now discuss are the barometric readings of ships north of latitude 20°, approaching and leaving the Sandheads; and are therefore all taken between distances of 60 and 120 miles from the coast. The observations having been made with marine mercurial barometers, it is probable that the amplitude of the range shewn by them may be somewhat less than would be shewn by barometers with large tubes, were it practicable to use such instruments on board ship; but all the instruments issued by the Marine Meteorological Department (and such only have been employed) have been subjected to a preliminary testing for sensitiveness and those only selected which have satisfied the test. It is therefore improbable that any large correction would be required to render the present data strictly comparable with those of a standard barometer.

The theory of diurnal land- and sea-breezes, as I understand it, is as follows. Under the morning sun, the air resting on a land-surface is more expanded than that resting on the sea; the larger part of the absorbed solar heat being used up, in the former case, in heating the air, while in the latter it is chiefly employed in evaporating water and charging the air with vapour; and, as I shewed in a former paper, the pressure of a given volume of air, when heated, is raised more than seven times as much as when the same amount of heat is consumed in charging it with vapour. The exact proportion at a temperature of 80° is 7·27. The expansion that follows in the two cases is not, however, quite in the same proportion, because more heat is consumed in work in the one case than in the other. Supposing that the expansion takes place under the same pressure in both cases, the ratios of expansion, for the same absorption of heat, would be 5·44 times as great in the case of the heated air as in that of the air charged with vapour, at the assumed temperature. The chief effect of this unequal expansion is to tilt the planes of equal pressure *(de, fg)* somewhat as represented in the accompanying diagram, and to produce a *head of pressure* at a certain height in the atmosphere over the land; while at the land- and sea-surface the pressure is perhaps but little altered. This process goes on as long as the temperature is rising; and the result is a current of air, at a certain height in the atmosphere, blowing from the land to the sea. But this transfer of air from the land- to the sea-atmosphere, while tending to restore equilibrium at the higher level, produces an increase of static pressure at the sea-surface, and reduces that at the land-surface; and therefore, a return current sets in at the lower level, which is the well known sea-breeze. As is well known, the sea-breeze sets in first on the coast-line; and as the day advances it extends in both directions, coming from further out at sea and penetrating to a greater distance inland. This continues till the equilibrium at the ground-surface is restored, which, however, does not occur until late in the evening. At Calcutta, the anemometer trace shews that, on an average, the retardation of the sea-breeze is such that it does not set in fairly until about 5 or 6 in the afternoon. Its prevalence, for some hours after this, is familiar to all residents in Calcutta in the cool southerly wind

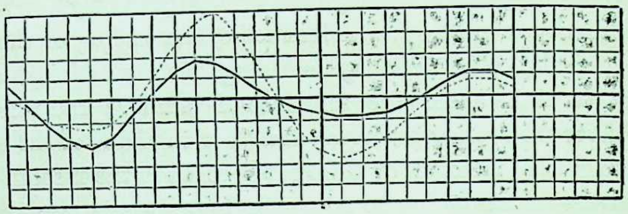


which, in the hot weather, sets in about the hour of the evening drive, is at its height about the usual dinner-hour, and makes the south verandah so pleasant for the post-prandial lounge. It lulls gradually, and as a rule ceases to be felt about midnight. Meanwhile, the cooling of the lower and more heated strata of the air, by reducing their elasticity, allows the higher strata to sink under the influence of gravity; and this, the more rapidly, the faster the cooling proceeds; and since, in virtue of the momentum acquired during the interval of more rapid cooling, the motion continues, after the contraction has begun to relax, the lower strata are dynamically compressed, producing the evening maximum of barometric pressure. As the expansion in the morning is greatest over the land, so also is the contraction in the evening; and, owing to this, the isobaric planes at a certain elevation are again disturbed, sinking lower over the land and producing a head of pressure over the sea. This disturbance causes a transfer of air from over the sea to the land at the higher level; and is followed by an accumulation of pressure at the land-surface, causing the outflow of the land-wind in the early morning hours.

According to this theory, then, there should be an excess of pressure over the land in the morning and as long as the land-wind prevails, and an excess of pressure over the sea in the afternoon and evening; and we might expect that, at the time of the afternoon minimum, when, according to the theory of the barometric tides, the air is exercising simply a static pressure, the minimum of the sea-curve would shew a much less depression than the land-curve, while the reverse would hold good at the time of the morning minimum. A comparison of the Calcutta curve with that of the head of the Bay, superimposed in the accompanying diagram, shews that these relations really obtain in nature. Any small increase in the amplitude of the marine barometric curve which may be required to render it strictly comparable with that of the Calcutta standard barometer, would only have the effect of increasing the difference of the night maximum and minimum, and somewhat diminishing that of the morning maximum and afternoon minimum.

In the diagram, I have represented the curves as deviations from the same line of mean pressure. Actually, in January, the mean pressure of the land is in general lower than that over the sea. It must be remembered also that the places represented are 80 or 90 miles from the coast-line; and therefore quite on the limits of the belt within which the daily oscillation of the surface-winds is experienced. I anticipate that, when the data for March and April shall be brought into comparison in like manner, the two curves will shew a still greater difference, indicating a greater transfer of air.

The following are the values for the six hours of observation, deduced from the marine registers; the co-efficients of Bessel's formula, computed therefrom; and the hourly values calculated from the formula: in conjunction with which I give also the corresponding values for the Calcutta curve.



Means of observations of Pressure. Sandheads. January.

Hour.	No. of obs.	Mean.	Hour.	No. of obs.	Mean.	Hour.	No. of obs.	Mean.
Mid.	37	30·029	8	46	30·047	16	38	30·004
4	62	29·983	Noon.	64	30·042	20	50	30·027

Bessel's formula. Sandheads. January.

$$x = 30{\cdot}022 + {\cdot}0068 \sin (n\,15^\circ + 272^\circ\,27') + {\cdot}0288 \sin (n\,30^\circ + 152^\circ\,3') + {\cdot}0093 \sin (n\,45^\circ + 90^\circ).$$

Computed values. Sandheads and Calcutta. January.

Hour.	Sandheads.	Calcutta.	Hour.	Sandheads.	Calcutta.
Mean	30·022	30.011	Mean.	30·022	30·011
Mid.	+ ·016	+ ·003	Noon.	+ ·011	+ ·032
1	— ·001	— ·006	13	— ·001	— ·002
2	— ·021	— ·015	14	— ·010	— ·031
3	— ·037	— ·021	15	— ·014	— ·048
4	— ·042	— ·024	16	— ·016	— ·054
5	— ·033	— ·020	17	— ·016	— ·051
6	— ·013	— ·005	18	— ·014	— ·040
7	+ ·010	+ ·021	19	— ·008	— ·024
8	+ ·028	+ ·050	20	+ ·002	— ·007
9	+ ·037	+ ·072	21	+ ·014	+ ·006
10	+ ·035	+ ·078	22	+ ·023	+ ·012
11	+ ·024	+ ·062	23	+ ·024	+ ·010

CONTENTS

OF THE NATURAL HISTORY PART (PT. II.) OF THE

JOURNAL OF THE ASIATIC SOCIETY OF BENGAL FOR 1876.

No. 1, (issued June 26th, 1876). *On the General Theory of Duplex Telegraphy* (with a Woodcut).—*By* LOUIS SCHWENDLER.—*On some Lizards from Sind, with Descriptions of new Species* of Ptyodactylus, Stenodactylus, *and* Trapelus (Pls. I and II).—*By* W. T. BLANFORD.—*On certain protracted Irregularities of Atmospheric Pressure in the Indian Monsoon region, and their Relation to Variations of the local Rainfall.—By* H. F. BLANFORD.—*Description of a new Species of* Phasmidæ (Pl. XI).—*By* J. WOOD-MASON.—*Description of* Felis Shawiana, *a new Lyncine Cat from Eastern Turkestan.—By* W. T. BLANFORD.—*Description of a new Species of* Cetoniidæ.—*By* J. WOOD-MASON.

No. 2, (issued August 18th, 1876). *An Account of Experiments made in* 1875 *and* 1876 *in various parts of India, for the purpose of comparing the observed Temperature of the Dew-point with that computed from the Psychrometer by different methods of Reduction.—By* H. F. BLANFORD.—*List of the Birds collected on the Expedition into the Dafla Hills, Assam, together with those obtained in the adjacent Darrang Terai* (Pls. III and IV).—*By* H. H. GODWIN-AUSTEN.—*On the Physical Geography of the Great Indian Desert with especial reference to the former Existence of the Sea in the Indus Valley; and on the Origin and Mode of Formation of the Sand-hills.—By* W. T. BLANFORD.

No. 3, (issued November 14th, 1876). *A Sketch of the Vegetation of the Nicobar Islands* (Pls. XII and XIII).—*By* S. KURZ.—*Description of* Golunda Ellioti *from Sind* (Pl. X).—*By* W. T. BLANFORD.—*On the* Cyclostomacea *of the Dafla Hills, Assam* (Pls. VII and VIII, A).—*By* H. H. GODWIN-AUSTEN.—*Descriptions of some new Land and Fresh-Water Shells from India and Burmah* (Pl. XIV).—*By* W. THEOBALD.—*Description of new Species of* Blattidæ *belonging to the Genus* Panesthia.—*By* J. WOOD-MASON.

No. 4, (issued April 19th, 1877). *Fifth List of Birds from the Hill Ranges of the North-East Frontier of India* (Pls. V, VI, and IX).—*By* H. H. GODWIN-AUSTEN.—*Contributions towards a Knowledge of the Burmese Flora.—By* S. KURZ.—*On the* Helicidæ *collected during the Expedition into the Dafla Hills, Assam* (Pl. VIII).—*By* H. H. GODWIN-AUSTEN.—*On the Physical Explanation of the Inequality of the two Semi-diurnal Oscillations of Barometric Pressure.—By* H. F. BLANFORD.—*Contributions towards the knowledge of the Fossil Flora in India. I. On some Fossil Plants from the Damuda Series in the Raniganj Coalfield, collected by* MR. J. WOOD-MASON (Pls. XV—XXI).—*By* OTTOKAR FEISTMANTEL.

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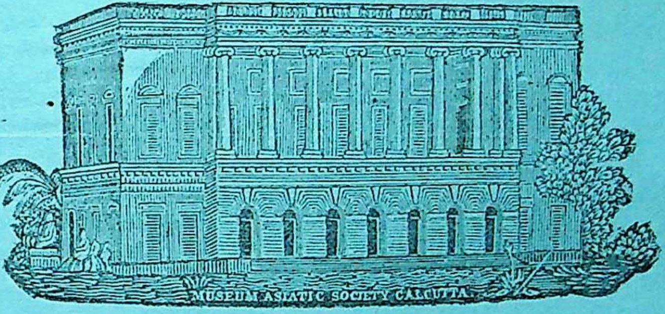
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CONTENTS.

Page

VI.—*Contributions towards a Knowledge of the Burmese Flora.—By* S. Kurz, ... 49

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part II.—PHYSICAL SCIENCE.

No. II.—1877.

VI.—*Contributions towards a Knowledge of the Burmese Flora.*

By S. Kurz.

(Continued from Vol. XLV, p. 310.)

RHIZOPHOREÆ.

Conspectus of Genera.

Subord. I. RHIZOPHOREÆ. Ovary inferior. Albumen none. Seeds germinating on the tree, the thick radicle rapidly enlarging and protruding from the summit of the fruit. Salt-loving shrubs or trees.

* *Ovary-cells with* 2—6 *ovules.*

Rhizophora. Calyx 4-cleft. Petals entire. Anthers 8—12, nearly sessile. Ovary 2-celled, the cells 2-ovuled.

Ceriops. Calyx 5—6-cleft. Petals notched, appendaged. Stamens 10—12. Ovary 3-celled, the cells 2-ovuled.

Kandelia. Calyx 5—6-cleft. Petals cut. Stamens many, the filaments capillary. Ovary 1-celled, with 6 ovules.

* * *Ovary-cells with a solitary ovule.*

Bruguiera. Calyx 8—14-cleft. Petals 2-cleft, appendaged. Stamens 16—28, the filaments filiform. Ovary 2—4-celled.

Subord. II. LEGNOTIDEÆ. Ovary inferior, almost superior or free. Embryo imbedded in a fleshy albumen. Seeds germinating in the ordinary way.

* *Ovary inferior. Calyx bell-shaped beyond the ovary.*

Carallia. Calyx-lobes short, erect. Stamens 10—16. Ovary-cells 2-ovuled. Flowers cymose.

Pellacalyx. Calyx-lobes short, recurved? Stamens 10—12. Ovary-cells many-ovuled. Flowers fascicled.

* * *Ovary superior or nearly so, with a broad base adnate to the calyx.*

Gynotroches. Calyx without bractlets. Stamens 8—10, the filaments elongate. Ovary-cells 4-ovuled.

Rhizophora, L.

Conspectus of Species.

Flowers pedicelled, the petals villous along the borders; stamens 8, ... *R. mucronata.*
Flowers sessile, the petals quite glabrous; stamens 8—12, ... *R. conjugata.*

1. R. MUCRONATA, Lamk. Enc. VI. 89; Wight Icon. t. 238; Miq. Fl. Ind. Bat. II. 584. (*Rhizophora Mangle*, Roxb. Fl. Ind. II. 459; *R. stylosa*, Griff. Not. Dicot. 665. t. 640; *Rh. macrorrhiza*, Griff. in Med. and Phys. Trans. Calc. VIII. 1836. 8 and Not. Dicot. 664).

HAB. Frequent in the mangrove-swamps of the shores from Arracan down to Tenasserim.—Fl. Fr. ∞.

2. R. CONJUGATA. L. sp. pl. 634; Miq. Fl. Ind. Bat. II. 584. (*R. Candelaria*, Griff. in Med. and Phys. Trans. Calc. VIII. 7).

HAB. Common in the mangrove swamps along the shores from Arracan down to Tenasserim and the Andamans.—Fl. Fr. ∞.

Ceriops, Arn.

Conspectus of Species.

Cymes compact, on very short peduncles; petals bristly fringed towards their tips, .. *C. Roxburghiana.*
Cymes rather lax; petals terminated by 2 or 3 club-shaped appendages, *C. Candolleana.*

1. C. ROXBURGHIANA, Arn. in Ann. Nat. Hist. I. 362; Miq. Fl. Ind. Bat. II. 591. (*Rhizophora decandra*, Griff. Not. Dicot. 663; *Bruguiera decandra*, Griff. in Med. and Phys. Trans. Calc. VIII. 1838. 10).

HAB. Common in the littoral forests all along the shores from Chittagong down to Tenasserim and the Andamans.—Fl. HS.; Fr. CS.

2. C. CANDOLLEANA, Arn. in Ann. Nat. Hist. I. 364; Wight Icon. t. 240; Miq. Fl. Ind. Bat. II. 590.

HAB. Frequent in the mangrove swamps of the Andamans.—Fl. HS.; Fr. CS.

Kandelia, W. A.

1. K. RHEEDEI, WA. Prod. I. 34; Wight Ill. I. 209. t. 89; Miq. Fl. Ind. Bat. II. 585.

HAB. Frequent in the littoral forests, especially the tidal ones, at the debouchures of the larger riversof Pegu and Tenasserim.—Fl. HS.; Fr. RS.

Bruguiera, Lamk.

Conspectus of Species.

Subg. I. Kanilia, Bl. Calyx-tube almost club-shaped, the limb 8-cleft. Petals 8, bearing bristles at the tips. Stamens 16, the filaments filiform and longer than the cordate or ovate anthers. Fruit cylindrical.

Calyx-tube narrowed at base, ribbed, the lobes very short and stiff, ... *B. parviflora.*
Calyx-tube obtuse at the base, smooth, the lobes nearly as long as the tube, .. *B. caryophylloides.*

Subg. II. Mangium, Bl. Calyx-tube almost bell-shaped, the limb 10—14-cleft. Petals 10—14. Stamens 20—28, the anthers linear, longer than the filaments. Ovary 3—4-celled. Fruit turbinate.................................... *B. gymnorhiza.*

1. B. PARVIFLORA, WA. Prod. I. 311; Miq. Fl. Ind. Bat. II. 589; Griff. in Med. and Phys. Trans Calc. VIII. 10. (*Rhizophora parviflora*, Roxb. Fl. Ind. II. 461).

HAB. In the littoral forests of Tenasserim and the Andamans. (Helf. 2207).—Fl. CS.

2. B. CARYOPHYLLOIDES, Bl. Enum. I. 93; Miq. Fl. Ind. Bat. II. 589. (*Rhizophora caryophylloides*, Griff. Not. Dicot. t. 624).

HAB. In the mangrove swamps at the debouchure of the Salween in Upper Tenasserim.—Fl. Febr.; Fr. Apr.

3. B. GYMNORHIZA, Lamk. Enc. Bot. IV. 696; Miq. Fl. Ind. Bot. II. 586; Griff. in Med. and Phys. Trans. Calc. VIII. 10. (*B. Wightii*, Bl. Mus. Bot. 138; Miq. Fl. Ind. Bat. II. 587; *B. Rheedei*, Bl. Enum. I. 92; Miq. l. c.; Wight Icon. t. 239. A.; *B. parietosa*, Griff. Not. Dicot. 670. t. 641; *B. 10-angulata*, Griff. Not. Dicot. 669; *B. eriopetala*, Wight Ill. I. 210 and Icon. t. 239).

HAB. Common in the littoral forests all along the coasts from Chittagong down to Tenasserim and the Andamans.—Fl. Jan.—May.

I know only of one species of this alliance, flowering while still a shrub and becoming a tree of 80 ft. in height in favourable situations. The indument of the petals and the number or absence of bristles appear to me fallacious characters.

Carallia, Roxb.

Conspectus of Species.

Leaves usually entire; petals not embracing the filaments, ... *C. lucida.*
Leaves serrulate; petals embracing the filaments, ... *C. lanceæfolia.*

1. C. LUCIDA, Roxb. Corom. Pl. III. 211 and Fl. Ind. II. 481; Griff. in Med. and Phys. Trans. Calc. VIII. 11; WA. Prod. I. 312; Wight Icon. t. 605.—(*C. integerrima*, DC. Prod. III. 33; Bth. in Linn. Proc. III. 74; Bedd. Fl. Sylv. t. 193; *C. zeylanica*, Arn. in Wight Illustr. t. 90).

HAB. Frequent in the tropical and moister upper mixed forests, ascending into the hill-forests up to 4000 ft. elevation, rare in the low forests, all over Pegu, Martaban, and Tenasserim.—Fl. C. S.; Fr. HS.

2. C. LANCEÆFOLIA, Roxb. Fl. Ind. II. 481; Wight Icon. t. 604; Bth. in Linn. Proceed. III. 75.—(*C. confinis*, Bl. Mus. Lugd. Bat. I. 129).

HAB. In the tropical forests of Tenasserim.

Gynotroches, Bl.

1. G. AXILLARIS, Bl. Mus. Lugd. Bat. I. 127. t. 31; Bth. in Linn. Proc. III. 76.

HAB. Upper Tenasserim, Moulmein (Lobb.).

COMBRETACEÆ.

Conspectus of Genera.

Subord. I. COMBRETEÆ. Calyx-lobes valvate. Stamens without alternating glands at the base, the filaments often inflexed in bud; anthers versatile, opening in longitudinal slits. Ovary with 2 to 12 suspended ovules. Flowers in racemes, spikes, or heads.

* *Calyx-limb deciduous.*

× Calyx-tube short, constricted but not produced beyond the ovary.

TERMINALIA.—Petals none. Stamens inflexed in bud, exserted. Flowers spiked or panicled. Erect trees.

COMBRETUM. Petals very rarely wanting. Stamens straight in bud. Flowers usually racemose or panicled. Usually scandent shrubs.

× × Calyx-tube elongate and produced beyond the ovary.

ANOGEISSUS. Calyx-tube 2-winged at the base. Stamens 10, exserted. Leaves alternate. Flowers in heads, small.

QUISQUALIS. Calyx-tube very long and slender, the limb small. Stamens 10, exserted. Leaves opposite. Flowers showy, in racemes.

* * *Calyx-limb persistent.*

CALYCOPTERIS. Calyx-tube 5-ribbed, not produced beyond the ovary, the limb enlarging. Stamens 10, included. Leaves opposite. Flowers racemose. Climbers.

LUMNITZERA. Calyx-tube elongate, narrowed beyond the ovary. Stamens 5 or 10, exserted. Leaves alternate. Flowers racemose. Trees or erect shrubs.

Subord. II. GYROCARPEÆ. Calyx-lobes valvate or imbricate. Stamens alternating with as many glands or staminodes; filaments straight in bud; anthers adnate, opening by a slit along the inner edge or in 2 valves. Ovary with a solitary pendulous ovule. Leaves alternate. Flowers cymose.

ILLIGERA. Calyx-lobes valvate, deciduous. Fruit extended into 2 or 4 lateral wings. Climbers with 3-foliolate leaves.

GYROCARPUS. Calyx-lobes imbricate, 2 of them persistent and enlarging wing-like. Nut 2-winged at the top. Erect trees with entire or lobed leaves.

Terminalia, L.

Conspectus of Species.

Subg. I. Myrobalanus, Gærtn. Fruit a fleshy drupe, compressed or obsoletely angular, the putamen bony.

* *Spikes simple, solitary in the leaf-axils.*

O Spikes, quite glabrous.

Glabrous or pubescent; petioles very short, the base of the broad leaves more or less rounded,; drupes 1½—2 in. long, compressed, ... *T. catappa.*

As preceding but glabrous, the base of the leaves more or less acuminate; drupes about an in. long, obsoletely 5-angular, ovoid-oblong, red inside, ... *T. procera.*

O O Spikes puberulous or tomentose.

Leaf-buds rusty villous; leaves obovate, on 2—3 in. long petioles, usually silky pubescent; drupes obovoid, silky puberulous, ... *T. Belerica.*

* * *Spikes more or less panicled at the end of the branchlets, puberulous or tomentose.*

सन्दर्भ ग्रन्थ
REFERENCE BOOK

Young shoots and underside of the oblong leaves rusty villous, the petiole short; ovary villous; drupes oval, glabrous, ... *T. chebula.*

As preceding, but ovary quite glabrous, the flowers and fruits much smaller, the leaves more coppery villous beneath, ... *T. tomentella.*

Very young shoots rusty villous; leaves smooth and glabrous, acuminate, the petiole short; drupes oblong-lanceolate, obsoletely 5-cornered, glabrous, ... *T. citrina.*

Subg. II. Pentaptera, Roxb. Fruit a dry nut, with a chartaceous or fibrous-coriaceous pericarp, compressed or 3—5-cornered with as many equal or unequal wings, or only with 2 or a single wing all round.

* *Nuts usually 3-cornered, the angles expanded into 2 equal, or 3—1 unequal wings.* (Chuncoa, Pav.)

× Nuts large, equally 2-winged, $1\frac{1}{2}$—2 in. long. Spikes simple, axillary.

All parts glabrous; spikes puberulous or tomentose; leaves obovate, the petiole 2—3 in. long; nut 3-cornered, with 2 large equal spreading wings, about 3—$3\frac{1}{2}$ in. across, *T. bialata.*

As preceding, leaves smaller and shorter petioled; nuts equally 2-winged, only $\frac{1}{2}$—$\frac{3}{4}$ in. across, ... *P. pyrifolia.*

× × Nuts small, unequally 2—3-winged. Spikes forming terminal panicles.

Fruits unequally 3-winged, puberulous, brown, ... *T. paniculata.*

Fruits much smaller than in preceding, equally 2-winged, almost glabrous, pale coloured, ... *T. myriocarpa.*

* * *Nuts 4- or 5-cornered, all the angles expanded into equal wings.*

All parts more or less greyish tomentose; leaves strongly net-veined beneath, the petiole short, furnished with 2 stalked turbinate glands, ... *T. alata.*

All parts glabrous; leaves not prominently net-veined beneath, the petiole short, with 2 stalked turbinate glands; spikes panicled, like the calyxes, puberulous or almost tomentose, ... *T. crenulata.*

As preceding, but the panicled spikes and outside of calyx quite glabrous, .. *T. macrocarpa.*

1. T. Catappa, Linn. Mant. 519; DC. Prod. III. 11.; WA. Prod. I. 313; Roxb. Fl. Ind. II. 430; Bot. Mag. t. 3004; Wight Icon. t. 172; Bedd. Fl. Sylv. t. 20 (*T. Moluccana*, Lamk. Dict. I. 349; DC. l. c., non Roxb.).

Hab. Frequent in the beach-forests of the Andaman islands, probably also in Tenasserim; much cultivated in villages all over the country.—Fl. May, June; Fr. Apr.

2. T. procera, Roxb. Corom. Pl. III. t. 244 and Fl. Ind. II. 429; DC. Prod. III. 12.

Hab. Frequent in the tropical forests of the Andaman islands.

In Andaman Rep. p. 37, I stated that this species hardly differs from the preceding. This is a mistake. The Nicobar species of *Terminalia* which I presumed to be new (Journ. As Soc. Beng. 1876, 130) belongs here.

3. T. Belerica, Roxb. Corom. Pl. II. t. 198 and Fl. Ind. II. 431; DC. Prod. III. 12; WA. Prod. I. 313; Wight Ill. I. t. 91.; Miq. Fl. Ind. Bat. I/1. 600; Bedd. Fl. Sylv. t. 19. (*Myrobalanus belerica*, Gærtn. Fruct.

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II. 90. t. 97; Rheed. Hort. Malab. IV. t. 10; *T. fœtidissima*, Griff. Not. Dicot. 685; *T. laurinoides*, T. and B. in Miq. Fl. Ind. Bat. I/1. 600).

HAB. Frequent in the mixed forests up to 2000 ft. elevation, all over Burma and the adjacent provinces.—Fl. Apr. May; Fr. CS.

4. T. CHEBULA, Retz. Obs. V. 31; Roxb. Corom. Pl. II. t. 197 and Fl. Ind. II. 435; DC. Prod. III. 13; WA. Prod. I. 313; Miq. Fl. Ind. Bat. I/1. 601; Brand. For. Fl. t. 29.; Bedd. Fl. Sylv. t. 27. (*T. reticulata*, Roth. Nov. sp. 381; DC. l. c.).

HAB. Chittagong.

5. T. TOMENTELLA, Kurz in Journ. As. Soc. Beng. 1873. 80.

HAB. Frequent in the upper mixed and the low forests, all over Pegu and Martaban down to Tenasserim.—Fl. June; Fr. CS.

6. T. CITRINA, Roxb. Fl. Ind. II. 435; DC. Prod. III. 12; Miq. Fl. Ind. Bat. I/1. 602. (*Myrobalanus citrina*, Gærtn. Fruct. II. 91. t. 97).

HAB. Not unfrequent in the tropical forests of the Andamans; Tenasserim (Helf. 2178).—Fr. CS.

7. T. BIALATA, Wall. ap. Voigt. Cat. Suburb. Calc. 36 (*Pentaptera bialata*, Roxb. Fl. Ind. II. 441; DC. Prod. III. 15).

HAB. Not uncommon in the upper mixed forests of the Andamans.—Fl. RS.

8. T. PYRIFOLIA, (*Pentaptera pyrifolia*, Presl. Epim. Bot. 214; Walp. Ann. III. 859; *T. Javanica*, Miq. Fl. Ind. Bat. I/1. 602 ?)

HAB. Frequent in the mixed forests, especially the upper ones, all over Pegu and Martaban down to Tenasserim.—Fl. HS.; Fr. CS.

9. T. MYRIOCARPA, v. Heurck and Muell. Arg. Obs. Bot. 215.

HAB. Ava, Khakyen hills east of Bhamo (J. Anderson).—Fr. March.

10. T. ALATA, Roth. Nov. sp. 379; Miq. Fl. Ind. Bat. I/1. 603.—(*Pentaptera tomentosa*, Roxb. Fl. Ind. II. 440; DC. Prod. III. 14; *T. tomentosa*, WA. Prod. I. 314; Wight Icon. t. 195; Bedd. Fl. Sylv. t. 17; *T. elliptica*, Willd. sp. pl. IV. 969 ?).

HAB. Frequent in the lower mixed and the open forests, all over Pegu and Martaban.—Fl. HS.; Fr. CS.

11. T. CRENULATA, Roth. Nov. sp. 380; Miq. Fl. Ind. Bat. I/1. 603. (*Pentaptera glabra*, Roxb. Fl. Ind. II. 440; *T. glabra*, WA. Prod. I. 314; *Pentaptera obovata* and *P. crenulata*, DC. Prod. III. 14 and 15).

HAB. Not unfrequent in the upper mixed forests of the Pegu Yomah and Arracan.—Fr. CS.

12. T. MACROCARPA, (*Pentaptera macrocarpa*, Wall. Cat. 3982).

HAB. Frequent in the upper-mixed and the open forests, all over Pegu and Martaban down to Upper Tenasserim.—Fl. H. S.; Fr. CS.

Doubtful Species.

1. *Pentaptera gracilis*, Presl. Epim. 214; Walp. Ann. III. 859.

HAB. Upper Tenasserim, near Moulmein.

The leaves are described as whorled by threes, indicating a species of *Combretum* rather than of *Terminalia*.

Combretum, L.

Conspectus of Species.

Subg. I. Poivrea, Comm. Flowers 5-merous. Stamens 10, all equal or alternately shorter. Fruits usually 5-, rarely 4- or 6- or 8-cornered or -winged.

* *Calyx funnel-cup-shaped.*

× Petals none.

Leaves only $1\frac{1}{2}$—3 in. long; panicles greyish velvety, the floral leaves not discoloured, .. *C. apetalum.*

× × Petals present.

Leaves large, opposite; panicles rusty or tawny tomentose, the floral leaves white-discoloured; fruits with 5 chartaceous wings, ... *C. decandrum.*

Leaves often whorled by 2—4, smooth, coriaceous; panicles greyish tomentose without floral leaves; fruits with 5 sharp thick almost wing-like corners, ... *C. trifoliatum.*

Similar to the preceding, but leaves strongly nerved and net-veined; fruits sharply 4-cornered, ... *C. tetragonocarpum.*

* * *Calyx-tube tubular, the limb abruptly salver- or cup-shaped.*

Racemes, petioles, and branchlets greyish or rusty puberulous or velvety, ... *C. ovale.*

Panicles, petioles, and branchlets all rusty pilose; fruits 5-winged, puberulous, .. *C. pilosum.*

Subg. II. Combretum, DC. Flowers 4-merous. Stamens 8, equal or alternately shorter. Fruits usually 4-, rarely 5-winged or -cornered.

* *Calyx shorter or longer tubular-bell-shaped (the limb never abruptly cupular). Fruits winged, the wings chartaceous and broader than the diameter of the nut.*

× Flowers shortly pedicelled.

All parts glabrous, the leaves opposite; inflorescence and flowers velvety, *C. extensum.*

× × Flowers all sessile.

All younger parts, the inflorescence, and leaves beneath coppery or rusty lepidote; leaves large, opposite, ... *C. squamosum,*

Leaves usually whorled in threes (at least in the older branchlets), glabrous, when young minutely lepidote; inflorescence and young shoots puberulous, ... *C. Chinense.*

As preceding, but branchlets, petioles, and inflorescence all rusty tomentose; leaves more or less pubescent beneath, never lepidote, ... *C. dasystachyum.*

* * *Calyx funnel-cup-shaped. Fruits winged or angular.*

× Fruits 4- or 5-winged, the wings chartaceous. Leaves and fruits small.

† Nuts smooth and glabrous.

Young shoots rusty pubescent, the leaves and the 4- or 5-winged fruits glabrous; branchlets terete, ... *C. pyrifolium,*

All parts, also the 4-winged fruits, more or less silvery lepidote; branchlets 4-cornered. .. *C. quadrangulare.*

† † Nuts fibrillose-hirsute.

Leaves beneath resinose-dotted; inflorescence brown-lepidote; young shoots pubescent, .. *C. Wallichii.*

× × Fruits 4-cornered, the angles thick and rounded.

Inflorescence and young branchlets rusty puberous, the former also lepidote; leaves large, strongly nerved, and parallel-veined, ... *C. costatum.*

1. C. APETALUM, Wall. Cat. 3990.

HAB. Common in the dry forests of the Prome District; Ava, along the Irrawaddi from Segain southwards.—Fl. Sept.—Jan.; Fr. March.

2. C. DECANDRUM, Roxb. Corom, Pl. I. t. 59 and Fl. Ind. II. 232, non Jacq.; G. Don. in Linn. Trans. XV. 437 (*Poivrea Roxburghii*, DC. Prod. III. 18; WA. Prod. I. 317).

HAB. Common in all forests, especially the tropical ones, up to 3000 ft. elevation, all over Burma and adjoining provinces.—Fl. Nov.—Febr.

3. C. TRIFOLIATUM, Vent. Choix d. pl. 58. t. 58; Miq. Fl. Ind. Bat. I/1. 610; G. Don. in. Linn. Trans. XV. 439. (*Terminalia lancifolia*, Griff. Not. Dicot. 685. t. 644. f. 4; *Embryogonia lucida*, Bl. Mus. Lugd. Bat. II. t. 52).

HAB. Frequent in the swamp-forests of the alluvial lands all over Burma, from Ava down to Tenasserim.—Fl. Jan.—March; Fr. Apr. June.

4. C. TETRAGONOCARPUM, Kurz in Journ. As. Soc. Beng. 1872. 306.

HAB. Frequent in the swamp-forests of the alluvial lands of Pegu.—Fl. Febr. March; Fr. May, June.

5. C. OVALE, R. Br. in App. to Salt's Trav. in Abyss.; G. Don. in Linn. Trans. XV. 434.

HAB. Not unfrequent in the tropical and mixed forests of the Pegu Yomah; also in shrubbery etc. of Martaban east of Toungboo.—Fl. March to May.

Possibly only a variety of the following species.

6. C. PILOSUM, Roxb. Fl. Ind. II. 231; G. Don in Linn. Trans. XV. 434.—(*Poivrea pilosa*, WA. Prod. I. 317 in adn.; C. sp. Griff. Not. Dicot. 683?).

HAB. Pegu, Rangoon (Cleghorn); Tenasserim, from Moulmein (Falconer) to Mergui (Griff.); Ava, Kakhyen hills (J. Anderson).—Fl. Jan.

7. C. EXTENSUM, Roxb. Hort. Beng. 28 and Fl. Ind. II. 229; G. Don. in Linn. Trans. XV. 422?; Miq. Fl. Ind. Bat. I/1. 608. (*C. rotundifolium*, Roxb. Fl. Ind. II. 39, non Rich.; *C. Horsfieldii*, Miq. Fl. Ind. Bat. I/1. 609; *C. platyphyllum*, Heurck and Muell. Arg. Obs. bot. 1871. 243; *C. formosum*, Griff. Not. Dicot. 682).

HAB. Frequent in all leaf-shedding forests, especially along the larger rivers, all over Burma and the adjoining provinces.—Fl. Jan.—March; Fr. May.

8. C. SQUAMOSUM, Roxb. Fl. Ind. II. 231; Miq. Fl. Ind. Bat. I/1. 607; G. Don in Linn. Trans. XV. 438. (*C. lepidotum*, Presl Bot. Bemerk. 142; Walp. Ann. I. 290).

Hab. Frequent in the lower mixed and the open forests, especially the low ones, all over Pegu and from Martaban down to Tenasserim.—Fl. March, Apr. and Nov. ; Fr. CS. and May, June.

A variety, or rather sport, from Prome (J. Anderson) with abnormal much bracted inflorescences, has all the scales developed into yellowish hairs, so as to appear hirsute all over. *C. punctatum*, Bl., differs not only by the very short obovate petals, but also in the inflorescence, shape of leaves, and the smaller fruits.

9. C. Chinense, Roxb. Fl. Ind. II. 230 ; G. Don. in Linn. Trans. XV. 432 ? (*C. ternatum*, Wall. Cat. 4002 ; *C. Griffithii*, Heurck and Muell. Arg. Obs. bot. 231).

Hab. Not unfrequent in the tropical forests of the Martaban hills, east of Tounghoo, up 3000 ft. elevation ; Chittagong.—Fr. March, Apr.

Don's *C. Chinense* is unknown to me and may possibly be the same as *C. squamosum*, Roxb., but the petals are apparently different.

10. C. dasystachyum, Kurz in Journ. As. Soc. Beng. 1874. 187.

Hab. Not unfrequent in the tropical forests, especially along choungs, along the eastern slopes of the Pegu Yomah and of Martaban.—Fl. March, Apr.

11. C. pyrifolium, Kurz in Journ. As. Soc. Beng. 1874. 188 (*Pentaptera pyrifolia*, Wall. Cat. 3985, non Presl).

Hab. Ava, on Taong-dong (Wall.) ; near Mandalay (J. Anderson). —Fr. Sept.—Nov.

12. C. quadrangulare, Kurz in Journ. As. Soc. Beng. 1874. 188.

Hab. Tenasserim (Helf. 2181).—Fl. Apr., May.

Judging from the description only, I do not think that this species may be compared with *C. stelligerum* of Presl.

13. C. Wallichii, DC. Prod. III. 21.

Hab. Tropical forests of Chittagong ; Ava, Khakyen hills.—Fl. RS. ; Fr. CS.

14. C. costatum, Roxb. Fl. Ind. II. 227.

Hab. Martaban to Tenasserim (Falconer, Brandis).—Fr. HS.

Doubtful Species.

C. stelligerum, Presl. Epim. 215 ; Walp. Ann. III. 860.

Hab. Tenasserim, near Moulmein (Helf.).

Anogeissus, Wall.

Conspectus of Species.

* *Beak as long as or longer than the nut.*

Leaves oval to ovate-lanceolate, retuse or blunt, glabrous ; flower-heads several together on a branched peduncle, ... *A. latifolia.*

Leaves acuminate, pubescent at least when young; flower-heads solitary on a simple peduncle, $\frac{1}{2}$—$\frac{3}{4}$ in. across, ... *A. acuminata.*

* * *Beak shorter than the nut.*

Leaves obovate; flower-heads $\frac{1}{4}$ in. across, solitary on a simple peduncle,.. *A. pendula.*

1. A. ACUMINATA, Wall. Cat. 4014; Walp. Rep. II. 63; Bedd. Fl. Sylv. t. 16. (*Conocarpus acuminatus*, Roxb. Fl. Ind. II. 443; DC. Prod. III. 17; WA. Prod. I. 316; DC. in Mém. d. Génèv. IV. 35. t. 3).

Var. α. GENUINA, ovary and style villous; fruits and the beak more or less pubescent.

Var. β. PHILLYREÆFOLIA, (*A. phillyreæfolia*, Heurck and Muell. Arg. Obs. Bot. 209), ovary and style minutely appressed-pubescent; fruits and beak glabrous or nearly so.

HAB. Var. α. frequent in the mixed (especially the upper ones) and also in tropical forests, from Chittagong and Martaban down to Tenasserim, up to 3000 ft. elevation; var. β. restricted to the alluvial plains of Ava, Prome, and Pegu, chiefly in the swamp-forests.—Fl. Febr., March; Fr. Apr., May.

This tree is remarkable by the bark, which consists of herbaceous green tubercles covered with a smooth grey epidermis which is easily scraped off. By this mark the tree can be recognised from all others in Burma, but in the plains (the var. β.) the bark becomes white marmorate and conchoid (as in *Emblica officinalis*). I should certainly have specifically separated this swamp variety had I not met with trees that bore both kinds of bark.

Quisqualis, L.

1. Q. INDICA, L. sp. pl. 556; Bot. Mag. t. 2033; Bot. Reg. t. 492; DC. Prod. III. 23; Roxb. Fl. Ind. II. 427; Wight Illust. I. t. 92; Miq. Fl. Ind. Bat. I/1. 610; Griff. Not. Dicot. 683 (*Q. longiflora*, Presl. Epim. 216; Walp. Ann. II. 860).

Var. α. GENUINA, bracts leafy, from ovate and lanceolate to linear-lanceolate; petals oblong or elliptically oblong, blunt or nearly so.

Var. β. VILLOSA, (*Q. villosa*, Roxb. Fl. Ind. II. 426; DC. Prod. III. 23), bracts subulate to linear, small and inconspicuous; petals usually obovate and often almost notched.

Var. γ. OXYPETALA, as preceding, but the petals broadly lanceolate and acute or nearly so.

HAB. Not unfrequent in the tropical and lower mixed forests from Ava and Pegu down to Tenasserim; var. γ. Ava, Khakyen hills east of Bhamo (J. Anderson).—Fl. March to May.

Calycopteris, Lamk.

Conspectus of Species.

Leaves pubescent, rarely almost glabrous; longer stamens ¼—⅓ as long as the acute calyx-lobes, ... *C. nutans.*
Leaves glabrous; longer stamens as long as the long bluntish calyx-lobes, *C. floribunda.*

1. C. NUTANS. (*Getonia nutans*, Roxb. Fl. Ind. II. 428; DC. Prod. III. 15; *Getonia floribunda*, WA. Prod. I. 315, non Roxb.).

Var. α. ROXBURGHII, leaves ovate-oblong to ovate-lanceolate, the larger ones 5—6 in. long, firmly chartaceous, more or less rusty or tawny pubescent beneath.

Var. β. GLABRIUSCULA, the larger leaves 3—4 in. long, oblong to ovate-oblong, thin chartaceous, nearly glabrous.

HAB. Frequent in the mixed forests, shrubbery, along bushy river-sides, &c., also in the savannahs, from the plains up to 2,000 ft. elevation and higher; all over Prome, Pegu and Martaban down to Tenasserim.—Fl. Jan.—March; Fr. Febr.—May.

Wight and Arnott state that *C. nutans* with short stamens does not occur in Hindustan, but all the specimens which I have seen from there belong to *C. nutans*, none to *C. floribunda*, Lamk. (*Getonia nutans*, Roxb. Corom. Pl. I. 61. t. 87 ?).

Lumnitzera, Willd.

Conspectus of Species.

Flowers white; stamens 10, about as long as the petals, ... *L. racemosa.*
Flowers crimson; stamens 5—10, twice as long as the petals, ... *L. littorea.*

1. L. RACEMOSA, Willd. Nov. Act. Nat. Cur. Berol. IV. 186; DC. Prod. III. 22; WA. Prod. I. 316; Miq. Fl. Ind. Bat. I/1. 606. (*Petaloma alternifolia*, Roxb. Fl. Ind. II. 372; Rheed. Hort. Malab. VI. t. 37).

HAB. Frequent along tidal channels, &c., of the beach-forests, also in the tidal forests, all along the coasts from Arracan down to Tenasserim and the Andamans.—Fl. HS.

2. L. LITTOREA, Voigt Cat. Hort. Calc. 39. (*Pyrranthus littoreus*, Jack Mal. Misc. II. 57; *L. coccinea*, WA. Prod. I. 316; Miq. Fl. Ind. Bat. I/1. 606; *L. pentandra*, Griff. Not. Dicot. 684).

HAB. Tenasserim, in the mangrove jungles of Mergui (Griff.).—Fl. Fr. Sept.

Illigera, Bl.

1. I. APPENDICULATA, Bl. Bydr. 1153; Miq. Fl. Ind. Bat. I/1. 1094; DC. Prod. XV/1. 251. (*I. Coryzadenia*, Meisn. in DC. Prod. XV/1. 251; *Coryzadenia trifoliata*, Griff. Not. Dicot. 356 ?).

Hab. Frequent in the tropical forests of the Pegu Yomah and from Martaban down to Tenasserim and the Andamans.—Fl. Octob.; Fr. March, Apr.

Gyrocarpus, Jacq.

1. G. Americanus, Jacq. Amer. 282. t. 178. f. 80; DC. Prod. XV/1. 247. (*G. Jacquini*, Roxb. Corom. Pl. I. 2. t. 1 and Fl. Ind. I. 445; Bth. Fl. Austr. II. 506; Bedd. Fl. Sylv. t. 196; *G. Asiaticus*, Willd. sp. pl. IV. 982; DC. l. c.; *G. acuminatus*, Meisn. in DC. l. c.; *G. sphenopterus* and *G. rugosus*, R. Br. Prod. Nov. Holl. 405; DC. l. c.).

Hab. Not unfrequent in the coast-forests of the Andamans and Tenasserim.—Fl. RS.; Fr. CS.

MYRTACEÆ.

Conspectus of Genera.

Trib. I. LEPTOSPERMEÆ. Ovary 2—5- rarely more-celled. Fruit a capsule, either opening at the summit in as many valves as there are cells, or very rarely indehiscent.

* *Stamens in a single row, free.*

Bæckea. Stamens usually fewer than 20. Flowers small. Leaves opposite, narrow.

Leptospermum. Stamens numerous, in a continuous row. Flowers solitary or crowded. Leaves alternating.

* * *Stamens united into 5 separate bundles.*

Melaleuca. Staminal bundles alternating with the petals. Flowers in heads or spikes. Leaves alternating.

Tristania. Staminal bundles opposite the petals. Flowers in cymes or corymbs. Leaves broad, alternate, rarely opposite.

Trib. II. MYRTEÆ. Ovary 2- or more-celled. Fruit an indehiscent berry or drupe very rarely opening by an apical opercle.

Subtr. I. EU-MYRTEÆ. Leaves opposite, dotted.

× Stigma peltate or capitate. Testa of seeds hard. Cotyledons small.

+ Ovules 2—6 in each cell.

Decaspermum. Ovary 5- or rarely 4-celled. Embryo long and narrow, curved, circular or spiral.

+ + Ovules numerous, in 2 or more series.

Rhodamnia. Ovary 1-celled, with 2 parietal placentas. Leaves 3-nerved.

Rhodomyrtus. Ovary 1-, 2-, or 3-celled, with 2 rows of superposed ovules in each cell and the ovules separated by transverse septa. Leaves sometimes 3-nerved.

Psidium. Ovary 2—7 (usually 4—5)-celled, the placentas often 2-lamellate. Leaves penni-nerved.

× × Stigma simple, minute. Testa of seed membranous.

Eugenia. Ovary 2—3-celled, with several ovules in each cell. Embryo thick and fleshy, either indivisible or with 2 thick fleshy cotyledons, the radicle short. Flowers 4- rarely 5-merous, solitary or in cymes or panicles. Leaves penni-nerved.

Subtr. II. LECYTHIDEÆ. Leaves alternate, not dotted. Calyx nearly valvate, rarely imbricate.

BARRINGTONIA. Stamens all perfect. Ovary 2- or 4-celled, with numerous ovules in each cell. Fruit fibrous or fleshy, often angular, 1- or very rarely 2—4-seeded.

CAREYA. Outer or inner series, or both, without anthers. Fruit globose to ovoid, many-seeded, the seeds imbedded in pulp. Ovary 4-celled.

Melaleuca, L.

1. M. LEUCADENDRON, L. Mant. 105: DC. Prod. III. 212; Roxb. Fl. Ind. III. 397; Bth. Fl. Austr. III, 142. (*M. Cajaputi*, Roxb. Fl. Ind. III: 394; *M. minor*, Sm. in Rees Cycl. V. 23. No. 2; DC. Prod. III. 212).

HAB. Tenasserim, Mergui, rare (Griff.).

Tristania, R. Br.

Conspectus of Species.

* *Calyx-lobes blunt or almost so.*

Leaves sessile or nearly so, rigidly coriaceous, glossy on both sides; flowers sessile or nearly so; calyx about 3 lin. across, ... *T. Merguensis.*

Leaves petioled, thin coriaceous, opaque beneath; flowers pedicelled; calyx only 1¼ lin. across; capsule exserted, ... *T. Burmanica.*

* * *Calyx-lobes subulate-acuminate.*

Leaves crowded, narrowed at both ends; flowers rather large; capsule hardly exserted, .. *T. Griffithii.*

1. T. MERGUENSIS, Griff. in Journ. As. Soc. Beng. 1854. 637 (*T. affinis*, Griff. Not. Dicot. 650. t. 636. f. 3).

HAB. Tenasserim, Mergui, along the coast (Griff. and Helf. 2341). —Fl. Aug.

2. T. BURMANICA, Griff. in Journ. As. Soc. Beng. 1854. 637.—(*T. sp.* Griff. Not. Dicot. 648 ?)

HAB. Not unfrequent in the eng- and hill-eng-forests, from Martaban down to Tenasserim, also ascending into the drier hill-forests up to 4000 ft. elevation; according to Dr. Brandis also in the Pegu Yomah. —Fl. March, Apr.; Fr. Apr., May.

3. T. GRIFFITHII, (*T. conferta*, Griff. Not. Dicot. 649, vix R. Br.).

HAB. Tenasserim, Mergui (Griff.)—Fl. Fr. Jan.

Decaspermum, Forst.

1. D. PANICULATUM, (*Nelitris paniculata*, Ldl. Collect. sub No. 16; DC. Prod. III. 231; Wight Icon. t. 521; *Eugenia polygama*, Roxb. Fl. Ind. II. 491; *N. polygama*, Bl. Mus. Lugd. Bat. I. 75; Miq. Fl. Ind. Bat. I. 474; *N. pallescens*, Miq. Suppl. Fl. Sumatr. 314).

Var. α. GENUINA, pedicels longer, calyx-lobes 5, more equal and usually somewhat acute; flowers in simple rarely branched racemes.

Var. β. THYRSOIDEA, (*N. paniculata*, Wall. Cat. 3627), pedicels shorter, sometimes very short; calyx-lobes 4, usually unequal, more or less rounded; flowers somewhat smaller, often in thyrsoid racemes.

HAB. Var. α. very frequent in the drier hill-forests of Martabān and Tenasserim, freely springing up in toungyas, at 3000 to 4000 ft. elevation.—Fl. March.

Rhodamnia, Jack.

1. R. TRINERVIA, Bl. Mus. Lugd. Bat. I. 79; Bth. Fl. Austr. III. 278. (*Myrtus trinervia*, Sm. in Linn. Trans. III. 280; *Eugenia? trinervia*, DC. Prod. III. 279; Bot. Mag. t. 3223).

Var. α. CONCOLOR, (*Rhodamnia cinerea*, Griff. Not. Dicot. 653, non Jack; *R. concolor*, Miq. Suppl. Fl. Sumatr. 315; *R. trinervia*, Bl. l. c.), leaves green on both sides, beneath thinly and minutely puberulous or almost glabrescent; flowers usually by 4—7, but also fewer or solitary.

Var. β. SPECTABILIS (*R. spectabilis*, Bl. Mus. Bot. Lugd. Bat. I. 78; Miq. l. c. 479; *R. cinerea*, Jack Mal. Misc. II. 48; *Monoxora spectabilis*, Wight Icon. t. 524; *R. Nageli*, Miq. l. c. 478; *R. subtriflora*, Bl. Mus. Lugd. Bat. I. 79; Miq. l. c. 479; *R. Muelleri*, Bl. l. c.; Miq. l. c.), leaves beneath covered with a close minute silvery white pubescence, turning sometimes greyish when old; flowers usually fewer, or only 2 or solitary in the leaf-axils.

HAB. Var. α. Tenasserim, from Moulmein down to Mergui (Falconer, Helf. 2344; Griff. 2344; Wall. etc.)—Fl. Aug.

Psidium, L.

*1. P. GUYAVA, L. sp. pl. 470; Bth. Fl. Hongk. 120.

Var. α. PYRIFERUM, (*P. pyriferum*, L. sp. pl. 672; DC. Prod. III. 233; Roxb. Fl. Ind. II. 480; Bot. Reg. t. 1079; Rheed. Hort. Mal. III. t. 34), peduncles 1-flowered; fruits pear-shaped.

Var. β. POMIFERUM, (*P. pomiferum*, L. sp. pl. 672; DC. l. c. 234; Roxb. l. c.; Rheed. Hort. Malab. III. t. 48), peduncles usually 2-flowered, with a third flower in the axil of the forking; fruits globular or ovoid.

HAB. Now generally cultivated all over the country, and often as wild in village-woods.—Fl. Apr., May; Fr. RS.

Eugenia, L.

Conspectus of Species.

Subg. I. Syzygium, Gærtn. Calyx smooth inside, without intrastaminal thickened ring. Calyx-limb often obsolete and turning truncate after defloration. Petals free or often cohering in a deciduous calyptra. Flowers usually small. Berries often small, globular to ovoid and cylindrical, more or less sappy, 1- rarely 2-seeded.

* *Calyx elongate and cylindrical, or shorter and obversely conical.*—(Acmena, Wight).

× Flowers in simple or almost simple axillary racemes sometimes much reduced. Calyx much elongate. Berries ovoid.

Calyx tubular-narrowed, 1—$\frac{1}{2}$ in. long, the lobes broad and rounded; berries about an inch long, ovoid-oblong, crowned by the calyx-lobes,.............. *E. claviflora.*

Calyx club-shaped, $\frac{1}{3}$—$\frac{1}{2}$ in. long, the limb truncate; berry clavate-oblong, only $\frac{1}{3}$—$\frac{1}{2}$ in. long, crowned by the cup-shaped truncate calyx-limb,.......... *E. leptantha.*

× × Flowers in more or less corymb-like axillary and terminal panicles. Calyx more or less obconical.

+ Calyx at base pedicel-like contracted.

Calyx smooth; leaves somewhat glaucous and rather opaque beneath; berries black, .. *E. grata.*

Calyx (dried) granular-rough; leaves rather glossy beneath; berries white, .. *E. Zeylanica.*

+ + Calyx sessile, not narrowed pedicel-like at base.

Leaves more or less linear, net-veined between the remote indistinct irregular lateral nerves; shrub, ... *E. contracta.*

Leaves more or less oblong, somewhat glaucescent beneath, not net-veined between the close-set parallel lateral nerves; tree,.......................... *E. bracteolata.*

* * *Calyx hemispherical to funnel-shaped, sessile or contracted pedicel-like at the base.*

× Leaves usually opaque, green, the lateral nerves more or less distant, somewhat irregular, net-veined between. Inflorescence usually lateral from the older branches.

+ Calyx sessile, not tapering pedicel-like at the base.

† Leaves green on both sides.

Petiole $\frac{1}{2}$—$\frac{2}{3}$ in. long; leaves broader, not decurrent; flowers more than 3 together; panicle longer peduncled, the last ramifications very short,......... *E. operculata.*

As preceding, but leaves more obovate; panicle very short peduncled or almost sessile, more lax; flowers often by threes, ... *E. obovata.*

Leaves acuminately decurrent on a short petiole, more acuminate, ... *E. Paniala.*

† † Leaves glaucous or glaucescent beneath.

Branchlets terete or nearly so; panicles more or less peduncled; calyx soon truncate, the lobes obsolete,.. *E. cinerea.*

+ + Calyx narrowed into a longer or shorter pedicel-like base. Panicle short, sessile or nearly so, usually branched already from the base.

† Calyx-lobes well-developed, up to $\frac{1}{2}$ line long.

Similar to *E. cinerea*, the branchlets greyish; calyx-lobes $\frac{1}{3}$ lin. long, ... *E. præcox.*

Branchlets brownish; racemes sometimes corymb-like, slender, short,.... *E. cerasoides.*

† † Calyx soon truncate, the lobes obsolete.

Branchlets brown, 4-cornered, often wingedly so especially while young... *E. tetragona.*

Branchlets white, terete; panicles cyme-like, short, ... *E. balsamea.*

× × Leaves usually glossy, often drying blackish or brownish, the lateral nerves all thin and vein-like, more or less crowdedly parallel-running.

+ Calyx narrowed into a longer or shorter pedicel-like base.

† Inflorescence lateral from the older branchlets.

Calyx a line long, almost sessile; ramifications of panicle sharply 4-cornered; berries ovoid, the size of a pea; branchlets brownish,..................... *E. fruticosa.*

Calyx 2 lin. long, tapering into a thick pedicel-like base; ramifications of the panicle obsoletely 4-cornered; berries ovoid-oblong, $\frac{1}{2}$ in. long; branchlets white, .. *E. Jambolana.*

† † Inflorescence terminal (and often also axillary on the same branch).

‡ Branchlets brown.

O Leaves bluntish acuminate to blunt.

Leaves thin coriaceous, the lateral nerves thin but distinct; petiole 3 lin. long, slender, .. *E. cymosa.*

Leaves firmly coriaceous, the lateral nerves obsolete; petiole thick, not above a line long, ... *E. myrtifolia.*

O O Leaves long and sharply acuminate.

Leaves almost chartaceous, pale coloured beneath; petiole about 2 lin. long, .. *E. acuminatissima.*

‡ ‡ Branchlets white.

Leaves bluntish acuminate, almost chartaceous, elegantly tranversely veined, .. *E. venusta.*

+ + Calyx not or scarcely contracted at the base, sessile. Leaves blackish or reddish in drying.

† Branchlets white.

Leaves chartaceous; calyx-lobes about a line long; petals 2 lin. long or longer; filaments 4—5 lin. long, ... *E. rubens.*

Leaves coriaceous, the lateral nerves strong and prominent; calyx-lobes and petals shorter; filaments 2—3 lin. long; berries obovoid, ... *E. Thumra.*

† † Branchlets red-brown.

Like preceding, but lateral nerves thin and vein-like; berries almost globular, the size of a large cherry, ... *E. oblata.*

Subg. II. Jambosa, DC. Calyx inside usually with a circular or 4-angular intra-staminal ring, or the stamens inserted on the thickened ring itself; flowers often large; calyx-lobes conspicuous and persistent. Berries usually large, more or less turbinate or ovoid, the endocarp thick and fleshy. Seeds large.

* *Calyx-lobes in fruit spreading.*

× Calyx less than $\frac{1}{2}$ in. long.

+ Flowers sessile. Flowers in terminal and often also in axillary panicles.

† Leaves glossy, firmly coriaceous, the lateral nerves thin and parallel.

Leaves 5—6 in. long, blunt or nearly so; panicle corymb-like, peduncled; berry obovoid-pear-shaped, about an in. long, ... *E. grandis.*

Leaves only 2—3 in. long, decurrent at the base, bluntish acuminate, .. *E. lepidocarpa.*

Leaves cuneate at the base; panicles sessile, reduced and cluster-like, the ramifications very short and thick, joint-like, ... *E. pachyphylla.*

† † Leaves opaque, coriaceous, the lateral nerves curved and distant.

Leaves long-petioled; panicle terminal, corymb-like, ... *E. tristis.*

+ + Flowers pedicelled. Leaves more or less chartaceous, the lateral nerves curved.

Panicles axillary and terminal; calyx-base thick, pedicel-like, the true pedicel very short or almost wanting; leaves thin coriaceous, ... *E. lanceæfolia.*

Panicle almost corymb-like, little branched from the base; calyx-base clavate-narrowed, the true pedicel 3—6 lin. long; leaves coriaceous, ... *E. albiflora.*

Racemes simple, slender, lateral or axillary; calyx-base filiform and pedicel-like, the true pedicels long and filiform; leaves membranous, ... *E. Kurzii.*

× × Calyx an inch long or longer.

Leaves large, almost sessile, cordate or rounded at the base; corymbs lateral and terminal, ... *E. formosa.*

* * *Calyx-lobes in fruit incurved or inflexed.*

× Flowers sessile or nearly so.

Leaves cordate or rounded at the base, the petiole very short and thick; corymbs terminal, ... *E. macrocarpa.*

Leaves sessile with a cordate base, blunt; branchlets white, terete; corymbs small, lateral, ... *R. amplexicaulis.*

Leaves acuminate at both ends; panicle cluster-like reduced and lateral, .. *E. Malaccensis.*

× × Flowers truly or spuriously pedicelled.

+ Leaves opposite.

† Leaves rounded at the base. Fruits obversely turbinate, waxy, white or rose-coloured.

Branchlets usually 4-cornered and often wingedly so, white or pale rose-coloured; leaves acuminate, the intramarginal nerve as strong as the lateral nerves themselves, .. *E. aquea.*

Branchlets terete, brown; leaves bluntish, the intramarginal nerve faint and obscure, .. *E. Javanica.*

† † Leaves narrow, acute at the base, petioled.

Berries almost globular or ovoid, dull-yellow, ... *E. Jambos.*

+ \+ Leaves whorled by threes, narrow, obtuse at the base.

Leaves linear or linear-lanceolate, almost sessile; petals 4—16, ... *E. polypetala.*

1. E. CLAVIFLORA, Roxb. Fl. Ind. II. 488; Wight Icon. t. 606.

HAB. Not unfrequent in the tropical forests of the Andamans; also Tenasserim and Chittagong.—Fr. Febr.

2. E. LEPTANTHA, Wight Ill. II. 15 and Icon. t. 528. (*Syzygium* sp., Griff. Not. Dicot. 654).

HAB. Frequent in the tropical forests along the eastern and southern slopes of the Pegu Yomah, and from Tenasserim to the Andamans.—Fl. Febr.; Fr. Apr., May.

3. E. GRATA, Wall. Cat. 3586; Wight Ill. II. 15.

HAB. Tenasserim, apparently frequent.—Fl. Jan., March.

4. E. ZEYLANICA, Wight Ill. II. 14. and Icon. t. 73, non Roxb.; Bedd. Fl. Sylv. t. 202. (*Jambosa bracteata*, Miq. Fl. Ind. Bat. I. 437).

HAB. Not unfrequent in the tropical forests of the Andamans; also Tenasserim.—Fl. HS.

5. E. CONTRACTA, Wall. Cat. 3602.

HAB. Frequent in the stony or rocky bed of choungs in tropical forests, from Martaban down to Tenasserim.—Fl. March, Apr.

The Martaban specimens dry blackish and have the net-venation less prominent. They may possibly form a large and long-leaved variety of *E. cuneata*, Wall. Cat. 3598.

Another species from Tenasserim (Helf. 2407), near allied to the above, has larger leaves of a thinner texture and very lax net-venation. It is no doubt new, but the inflorescences are too young for description. It has white, while the above has red-brown bark.

6. E. BRACTEOLATA, Wight Ill. II. 15 and Icon. t. 531.

HAB. Tenasserim (Griff., Helf.).

7. E. OPERCULATA, Roxb. Hort. Beng. 37 and Fl. Ind. II. 486; Wight Icon. t. 552. (*Syzygium nervosum*, DC. Prod. III. 260; Bth. Fl. Hongk. 119).

HAB. Not unfrequent in the swamp-forests of Pegu, Martaban, and Upper Tenasserim.

8. E. OBOVATA, Wall. Cat. 3352. A. (*Syzygium polyanthum*, Thw. Ceyl. Pl. 116 and 417).

HAB. Ava (Griff. 2403); hills east of Bhamo (J. Anderson).

9. E. PANIALA, Roxb. Fl. Ind. II. 489; Wight Icon. t. 616.

HAB. Chittagong.—Fl. Apr.; Fr. June.

10. E. CINEREA, Wall. Cat. 3576.

HAB. Rare in the tropical forests of the Pegu Yomah (southern parts); Tenasserim, from Moulmein down to Mergui.—Fl. Apr.; Fr. Febr.

Possibly not different from the following species, which I know only from Roxburgh's description and figure.

11. E. PRÆCOX, Roxb. Fl. Ind. II. 488; Wight Icon. t. 619.

HAB. Hilly parts of Chittagong (Roxb.).—Fl. Jan.

12. E. CERASOIDES, Roxb. Fl. Ind. II. 488; Wight Icon. t. 615 (*Syzygium subnodosum*, Miq. Suppl. Fl. Sumatr. 313; *E. polyantha*, Wight Ill. II. 17 and Icon. t. 543).

Var. β. ANGUSTIFOLIA, leaves on shorter and thicker peticles, linear to oblanceolate-linear, with fewer more remote and arcuate nerves; panicles shorter and stouter, the ultimate branchings much reduced; the pedicel-like base of calyx shorter; berries the size of a pepper-kernel, globose, almost sessile, crowned by the truncate calyx-limb.—Probably a distinct species.

HAB. Chittagong; Tenasserim, from Moulmein down to Mergui (Griff., Helf.). Var. β. Ava, Khakyen hills (J. Anderson).—Fr. March.

13. E. TETRAGONA, Wight Ill. II. 16.

HAB. Ava, Khakyen hills east of Bhamo, at 3000—4000 ft. elevation.—Fl. Nov., Decb.

14. E. BALSAMEA, Wight Ill. II. 16.

HAB. Burma (according to Rev. Dr. Mason).

15. E. FRUTICOSA, Roxb. Fl. Ind. II. 487; Wight Icon. t. 624.

HAB. Frequent in the open, chiefly the eng-forests, along the eastern slopes of the Pegu Yomah, and from Martaban down to Tenasserim; also Chittagong.—Fl. Apr.; Fr. May, June.

16. E. JAMBOLANA, Lamk. Dict. III. 198; Wight Icon. t. 535; Roxb. Fl. Ind. 484; Brand. For. Fl. t. 30; Bedd. Fl. Sylv. t. 197.—(*Syzygium Jambolanum*, DC. Prod. III. 259; Miq. Fl. Ind. Bat. I. 458).

HAB. Frequent in all leaf-shedding forests but chiefly in the mixed ones, rarely entering the tropical forests, from Ava and Martaban down to Tenasserim and the Andamans.—Fl. Apr., May; Fr. May, June.

17. E. CYMOSA, Lamk. Dict. III. 199, non Roxb.; Wight Icon. t. 555. (*E. toddalioides*, Wight Ill. II. 16 and Icon. t. 542; *Syzygium. cymosum*, DC. Prod. III. 259; *Jambosa tenuicuspis*, Miq. Fl. Ind. Bat. I. 431; *Syzygium nelitricarpum*, T. et B. in Nat. Tydsch. Ned. Ind. XXV).

HAB. Tenasserim, Tavoy and Mergui.—Fl. Nov.

18. E. MYRTIFOLIA, Roxb. Fl. Ind. II. 490; Wight Icon. t. 618.

HAB. Tenasserim, Moulmein (according to a specimen admixed with Wall. Cat. 3573. A.)

19. E. ACUMINATISSIMA, (*Myrtus acuminatissima*, Bl. Bydr. 1088; *Jambosa acuminatissima*, Hassk. in Flora 1849. 592; Miq. Fl. Ind. Bat. I. 438; *E. ferruginea*, Wight Icon. t. 554).

HAB. Tenasserim (or Andamans ?) (Helf.)

20. E. VENUSTA, Roxb. Fl. Ind. II. 491; Wight Icon. t. 625 (*Syzygium Gardneri*, Thw. Ceyl. Pl. 117 ?)

HAB. Not unfrequent in the tropical forests of Toukyeghat, east of Tounghoo; Tipperah hills (Roxburgh).—Fl. March, Apr.

21. E. RUBENS, Roxb. Fl. Ind. II. 496; Wight Icon. t. 630. (*Jambosa Wightiana*, Bl. Mus. Lugd. Bat. I. 106; Walp. Ann. II. 636).

HAB. Forests of Chittagong (Roxb.); Tenasserim, from Moulmein down to Mergui.—Fl. Febr.—Apr.; Fr. Begin of RS.

If my identification prove correct, then it is only the length of the stamens and a thinner texture of the leaves that separates this species from *E. Thumra*. The petals and sepals, too, are nearly twice the size.

22. E. THUMRA, Roxb. Fl. Ind. II. 495; Wight Icon. t. 617.

HAB. Frequent in the tropical forests, especially in marshy places along choungs, of the Pegu Yomah, and from Martaban down to Tenasserim.—Fl. March, Apr.; Fr. May, June.

23. E. OBLATA, Roxb. Fl. Ind. II. 493; Wight Icon. t. 622.

HAB. Frequent in tropical forests, especially along marshy choungs, from Martaban down to Tenasserim.—Fl. March—May; Fr. June—Aug.

24. E. GRANDIS, Wight Ill. II. 15 and Icon. t. 614 (*E. cymosa*, Roxb. Fl. Ind. II. 492, non Lamk.).

HAB. Frequent in the tropical forests and occasionally in the moister upper mixed forests of the Pegu Yomah, Martaban, and Tenasserim.—Fl. Febr.; Fr. Apr.

25. E. LEPIDOCARPA, Wall. Cat. 3618 in part.—(*Syzygium Palembanicum*, Miq. Suppl. Fl. Sumatr. 313 ?).

HAB. In the eng-forests of Upper Tenasserim (Brandis).

26. E. PACHYPHYLLA, Kurz in Journ. As. Soc. Beng. 1873. 232.

HAB. Upper Tenasserim, Bithoko range, 3000 ft. (Brandis).—Fl. Apr.

27. E. TRISTIS, Kurz in Journ. As. Soc. Beng. 1873. 233.

HAB. In the eng-forests at Lounkim, Tenasserim (Brandis).—Fr. Apr.

28. E. LANCEÆFOLIA, Roxb. Fl. Ind. II. 494 ; Wight Icon. t. 621.

HAB. Chittagong (Hf. and Th.).—Fl. Nov. ; Fr. Febr.

29. E. KURZII, Duthie MS. (*E. cerasiflora*, Kurz in Journ. As. Soc. Beng. 1873. 233, non Miq.).

HAB. Rather rare in the tropical forests of Toukyeghat, east of Tounghoo.—Fl. March.

30. E. ALBIFLORA, Duthie MS. ; Kurz For. Fl. Burma I. 491.

HAB. Burma, probably Ava. (Griff. 2419).

31. E. FORMOSA, Wall. Pl. As. rar. II. 6. t. 108 (1831).—(*E. ternifolia*, Roxb. Fl. Ind. II. 489 (1832) ; Wight Icon. t. 611 ; *Jambosa formosa*, Wight Ill. II. 14 ; Miq. Fl. Ind. Bat. I. 412).

HAB. In the tropical forests of Chittagong and Upper Tenasserim.—Fl. Fr. March.

E. formosa, of Wall. Cat. 3609 is a mixture of fruits of this species and leaves of *E. Malaccensis*.

32. E. MACROCARPA, Roxb. Fl. Ind. II. 497 ; Wight Icon. t. 612. (*Jambosa macrocarpa*, Miq. Fl. Ind. Bat. I. 417.)

HAB. Frequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah, and from Martaban down to Tenasserim, up to 2000 ft. elevation.—Fl. March, Apr. ; Fr. Aug.

33. E. AMPLEXICAULIS, Roxb. Fl. Ind. II. 483 ; Wight Icon. t. 608.

HAB. Chittagong (Roxb.).

Specimens in Herb. Brandis (Nos. 1225, 1222, and 1223) from the tropical forests of Upper Tenasserim, come nearest to this species. They differ apparently by the sharply 4-angular branchlets and bluntish acuminate or bluntish leaves. The inflorescence is terminal, but otherwise quite agrees with Roxburgh's figure. The shape of the leaves is very variable, some of them almost agreeing with those of *E. aquea*.

*34. E. MALACCENSIS, L. sp. pl. 672 ; Roxb. Fl. Ind. II. 483 ; Wight Illust. II. 14. t. 98 (*Jambosa domestica*, Rumph. Herb. Amb. I. 121. t. 37 ; Miq. Fl. Ind. Bat. I. 411 ; *Jambosa Malaccensis*, DC. Prod. III. 288 ; Bot. Mag. t. 4408 ; *E. purpurea*, Roxb. Fl. Ind. II. 483 ; Wight Icon. t. 549 ; Griff. Not. Dicot. 654).

HAB. Planted in villages of Tenasserim.—Fl. HS.

*35. E. AQUEA, Burm. Fl. Ind. 114; Roxb. Fl. Ind. II. 492; Wight Icon. t. 550. (*Jambosa aquea*, DC. Prod. III. 288; Wight Icon. t. 216; Miq. Fl. Ind. Bat. I. 421).

HAB. Apparently only planted; Chittagong, Ava, Pegu, Martaban, and Tenasserim.—Fl. March, Apr.; Fr. May, June.

36. E. JAVANICA, Lamk. Encycl. III. 200. (*E. alba*, Roxb. Fl. Ind. II. 493; Wight Icon. t. 548; *Jambosa alba*, Rumph. Herb. Amb. I. 127. t. 39; Miq. Fl. Ind. Bat. I. 413).

HAB. Frequent in the coast-forests of the Andaman islands.—Fl. March, Apr.; Fr. May, June.

*37. E. JAMBOS, L. sp. pl. 672; Roxb. Fl. Ind. II. 494; Wight Illust. II. 14. (*Jambosa vulgaris*, DC. Prod. III. 286; Wight Icon. t. 435; Miq. Fl. Ind. Bat. I. 425).

HAB. Frequently planted in villages all over Burma.—Fl. May—July; Fr. CS.

38. E. POLYPETALA, Wall. Cat. 3616; Wight Ill. II. 14 and Icon. t. 610. (*E. angustifolia*, Roxb. Fl. Ind. II. 490, non Lamk.).

HAB. Chittagong (Roxb.).—Fl. March, April; Fr. June, July.

Barringtonia, Forst.

Conspectus of Species.

Subg. I. BUTONICA, Rumph. Calyx closed in bud, entire, valvately rupturing into 2 to 4 lobes. Ovary 4-celled. Flowers pedicelled.

* *Fruite angular, without appendages, 1-seeded.*

Flowers about 3 in. in diameter or larger, in corymb-like short erect racemes; leaves entire, sessile, ... *A. Asiatica.*

Flowers about an in. in diameter, in long slender pendulous racemes; leaves crenulate, very shortly petioled, ... *B. racemosa.*

* * *Fruit conically pyramidal, with short wing-like basal appendages.*

Leaves serrulate; racemes rather erect, puberous, ... *B. conoidea.*

Subg. II. STRAVADIUM, Juss. Calyx already in bud 3—4-cleft, the lobes imbricate.

* *Ovary 4-celled. Rachis of raceme very thick.*

+ Calyx-tube winged; fruits narrowly winged on the corners. Flowers sessile.

Calyx-lobes rounded, 2 lin. long; leaves obtuse or acute at the base, not decurrent, .. *B. augusta.*

Calyx-lobes triangular-ovate, more or less acute, more than 3 lin. long; leaves long-decurrent, ... *B. pterocarpa.*

+ + Calyx-tube terete or angular, not winged.

× Flowers sessile.

Leaves elongate, entire, long-petioled; calyx angular, ... *B. macrostachya.*

× × Flowers pedicelled.

Leaves elongate, long-petioled ; calyx terete, ... *B. pendula.*

* * *Ovary 2-celled. Rhachis of raceme slender. Flowers pedicelled. Fruits sharply 4-angular.*

Glabrous or pubescent ; flowers rather small, red ; leaves crenulate, shortly petioled, .. *B. acutangula.*

1. B. Asiatica, (*Mammea Asiatica*, L. sp. pl. 731 ; *B. speciosa*, L. f. Suppl. 312 ; Roxb. Fl. Ind. II. 636 ; Wight Icon. t. 547 ; Miq. Fl. Ind. Bat. I. 485, vix Forst. ; Paxt. Bot. Mag. X. 241. cum icon. ; Houtt. Fl. d. serr. IV. 409 cum icon. ; *Agasta Asiatica*, Miers in Linn. Trans. 2nd ser. Bot. I. 61. t. 12. f. 10—16 ; *Agasta Indica*, Miers l. c. 63. t. 12. f. 1—10).

Hab. Frequent in the coast-forests, especially the beach-forests, of the Andamans ; most probably also in those of Tenasserim.—Fl. Fr. HS.

2. B. racemosa, DC. Prod. III. 288 ; Roxb. Fl. Ind. II. 634 ; Freyc. It. Bot. 483. t. 107 ; Wight Icon. t. 151 ; Miq. Fl. Ind. Bat. I. 486 ; Griff. Not. Dicot. 659. t. 636. f. 2 ? ; Hook. Bot Mag. t 3831.—(*Eugenia racemosa*, L. sp. pl. 673 ; *Butonica racemosa*, Juss. gen. 326 ; Miers in Linn. Trans. 2nd. ser. I. 66. t. 13. f. 11—17. ; *Butonica rubra*, Miers l. c. 70. t. 14. f. 1—3 ; *Butonica terrestris*, Rumph. Hb. Amb. III. 181. t. 115 ; Miers l. c. 69. t. 14. f. 4—9 ; *Butonica inclyta*, Miers l. c. 71. t. 14. f. 19 ? ; *Butonica Zeylonica*, Miers l. c. 77).

Hab. Frequent in the coast-forests, especially the beach-forests, of Tenasserim and the Andamans.—Fl. April ; Fr. May, June.

3. B. conoidea, Griff. Not. Dicot. 656. t. 635 and t. 636. f. 1. (*B. alata*, Wall. Cat. 3633 ; *Butonica alata*, Miers in Linn. Trans. 2nd. ser. I. 70. t. 14. f. 10—15).

Hab. Coast-forests of Tenasserim from Moulmein southwards.—Fl. April.

Miers brings part of this species to his *B. alba* and in this case, as elsewhere, accuses the editor of Griffith's Posthumous Papers of having confused the plates, but in this he is greatly in error.

4. B. augusta, Kurz in Journ. As. Soc. Beng. 1873. 233 (*Doxomma augustum*, Miers in Linn. Trans. 2nd. ser. I. 105).

Hab. Tenasserim, from Moulmein southwards.—Fl. Febr.

5. B. pterocarpa, Kurz in Journ. As. Soc. Beng. 1873. 234. (*Doxomma magnificum*, Miers in Linn. Trans. 2nd ser. I. 106 ?).

Hab. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah, and Martaban down to Tenasserim.—Fl. March, April ; Fr. June.

Very nearly allied to the preceding, from which it differs in the few characters above given. The unripe fruits a good deal resemble those of *Doxomma Cochinchinense*, Miers (l. c. t. 16. f. 2), but this species has very long slender petioles.

6. B. MACROSTACHYA, (*Careya macrostachya*, Jack Mal. Misc. 47. ; DC. Prod. III. 295 ; *Doxomma macrostachyum*, Miers in Linn. Trans. 2nd ser. I. 104. ; *B. cylindrostachya*, Griff. Not. Dicot. 655 ; *Doxomma cylindrostachyum*, Miers l. c. 100 ; *Stravadium sarcostachys*, Bl. in v. Houtt. Fl. d. serr. VII. 24. ; *B. sarcostachys*, Miq. Fl. Ind. Bat. I. 490 ; *Doxomma sarcostachys*, Miers l. c. 102 ; *Doxomma acuminatum*, Miers l. c. ?).

HAB. Tenasserim, in the forests of Mergui (Griff. 2421/2) ; (Ava, accord. Miers).

7. B. PENDULA, (*Doxomma pendulum*, Miers in Linn. Trans. 2nd ser. I. 99. t. 15. f. 9—15 ; *Careya pendula*, Griff. Not. Dicot. 661. t. 634.)

HAB. Tenasserim, Mergui (*teste* Miers).

8. B. ACUTANGULA, Gærtn. Fruct. II. 96. t. 101 ; WA. Prod. I. 333 ; Miq. Fl. Ind. Bat. I. 488 ; Bedd. Fl. Sylv. t. 204 ; Roxb. Fl. Ind. II. 635. (*Eugenia acutangula*, L. sp. pl. 673 ; *Stravadium acutangulum*, Miers. in Linn. Proc. 2nd ser. I. 80, t. 17. f. 1—14 ; *Stravadium obtusangulum*, Bl. in v. Houtt. Fl. d. serr. VII. 24; Miers l. c. 81.; *Stravadium demissum*, Miers l. c. 81 ; *Stravadium Rheedii*, Bl. in v. Houtt. Fl. d. serr. VII. 24 ; Miers l. c. 82 ; *Stravadium pubescens*, Miers l. c. 83 ; *Stravadium coccineum*, DC. Prod. III. 289 ? ; Miers. l. c. 83 ?).

HAB. Frequent in the mixed forests, especially the lower ones and the savannahs, common in the swamp-forests, all over Burma from Chittagong and Ava down to Tenasserim.—Fl. April, May ; Fr. June, July.

Careya, Roxb.

Conspectus of Species.

Subg. I. CAREYA, Roxb. Outermost and innermost series of stamens reduced to filaments. Embryo consolidate.

* *Flowers long-pedicelled.*

Undershrub ; berries only an in. thick ; seeds about 3 lin. long, ... *C. herbacea.*

* * *Flowers sessile. Trees.*

Petals blunt or rounded, concave. Ovules in 2 rows in each cell, ... *C. arborea.*

Petals acute, the borders revolute. Ovules in 6 rows in each cell, ... *C. sphaerica.*

Subg. II. PLANCHONIA, Bl. Only the innermost row of stamens reduced to filaments. Embryo of 2 distinct cotyledons.

Fruits ellipsoid, angular-ribbed, ... *C. valida.*

1. C. ARBOREA, Roxb. Corem. Pl. III. 13. t. 218 and Fl. Ind. II. 638 ; Wight Icon. t. 556, sub nom. erron. *C. sphæricæ*, and Illust. II. t. 99 and 100 ; Miq. Fl. Ind. Bat. I. 494 ; Miers in Linn. Trans. 2nd ser. I. 97 ; Bedd. Fl. Sylv. t. 205 (*C. orbiculata*, Miers l. c. 98. t. 16. f. 6—8).

HAB. Frequent in the open forest and the lower mixed and savannah-forests, all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim.—Fl. April, May ; Fr. June, July.

2. C. SPHÆRICA, Roxb. Fl. Ind. II. 636; Wight Icon. t. 147; Miq. Fl. Ind. Bat. I. 494; Miers in Linn. Trans. 2nd ser. I. 97. t. 16. f. 9—15 ?).

HAB. Mountains of Chittagong (Roxb.).—Fl. April; Fr. July.

3. C. VALIDA, (*Pirigara valida*, Bl. Bydr. 1096; *Planchonia valida*, Miers in Linn. Trans. 2nd ser. I. 94; *Planchonia littoralis*, Bl. in v. Houtt. Fl. d. serr. VII. 25; Miers l. c. 94).

HAB. Frequent in the coast-forests of the Andaman islands.—Fl. HS.

Doubtful Genus.

1. *Lencymmæa salicifolia*, Prsl. Epim. Bot. 211; Walp. Ann. III. 891.

HAB. Tenassserim, Moulmein (Helfer).

A genus which is entirely enigmatic to me; the gamopetalous corolla and the insertion of the very numerous stamens on the bottom of the calyx form a puzzling combination of characters. If the corolla be incorrectly described, we may guess *Myrtaceæ* as its probable affinity.

MELASTOMACEÆ.

Conspectus of Genera.

Subord. I. MELASTOMEÆ. Ovary 2- or more -celled; the placentas attached to the middle or base of the axial angle, usually elongate, rarely sessile. Seeds usually numerous and minute, rarely few and large. Leaves usually 3—7-nerved from the base.

* *Placentas attached to the middle of the axial angle. Anthers opening by* 1 *or* 2 *apical pores.*

× Capsule dry or rarely sappy, dehiscing by apical valves, rarely irregularly rupturing.

Trib. 1. *OSBECKIEÆ.* Ovary with a conical or convex free apex. Connective usually produced beyond the base of the anthers. Capsule dry or berry-like. Seeds minute, cochleate.

OSBECKIA. Anthers usually all equal or nearly so. Fruit a capsule.

OTANTHERA. Anthers equal. Fruit a berry.

MELASTOMA. Anthers always unequal. Fruit a berry.

Trib. 2. *OXYSPOREÆ.* Connective acute or spurred behind, not appendaged in front. Seeds angular or oblong to club-shaped.

OXYSPORA. Calyx costate. Stamens 4, equal, or 8 and usually unequal. Ovary and the club-shaped capsule high-up adnate to the calyx. Flowers laxly cymose, in terminal panicles.

ALLOMORPHIA. Calyx costate. Stamens 8 or 10, nearly equal. Ovary free or adnate to the bottom of the calyx. Capsule ovoid, included in the urceolate costate calyx. Flowers clustered or almost whorled, in narrow terminal panicles.

OCHTHOCHARIS. Calyx terete and smooth. Stamens 10, equal. Ovary and capsule adnate to the calyx, the latter globular, smooth. Cymes often axillary, or rarely collected into terminal panicles.

ANERINCLEISTUS. Calyx terete. Anthers 8, equal. Capsule 4-valved at the top, almost free. Flowers in axillary fascicles or umbellets.

Trib. 3. *SONERILEÆ.* Ovary broadly carved out and depressed at the 3- to 5-cornered top. Connective rarely produced at the base. Capsule opening at the top into triangular valves, 3—5-cornered, rarely terete. Seeds minute, straight, angular (never cochleate).

SONERILA. Flowers 3-merous. Stamens 3 or 6. Capsule 3-celled. Herbs, or rarely undershrubs, sometimes stem-less.

SARCOPYRAMIS. Flowers 4-merous. Stamens 8. Capsule 4-celled, included in the succulent calyx. Succulent glabrous herbs.

× × Berry sappy or coriaceous, irregularly rupturing.

Trib. 4. *MEDINILLEÆ.* Ovary wholly, or only its angles, adnate to the calyx, the convex or conical top free. Stamens conform, or the alternating ones reduced to curiously shaped staminodes, inserted on the limb or thrust into the cavities formed by the adhesion of the ovary-angles to the calyx; anthers usually recurved.

× Stamens very unequal.

DISSOCHÆTA. Anthers 4 or 8, the connective with 2 bristles or lamellæ in front, often spurred behind. Panicles terminal.

ANPLECTRUM. Anthers 4 or 8, the connective usually not appendaged in front, shortly spurred behind. Ovary 4-crested at the top. Panicles often axillary.

× × Stamens almost equal.

MEDINILLA. Calyx-tube not or barely produced beyond the ovary. Anthers 8, 10, or 12, 2-lobed or 2-spurred in front, often bristly, 1—2-lobed or 1-spurred behind. Ovary 4—6-celled. Erect or scandent shrubs.

* * *Placentas inserted to the base of the axial angle or to the walls of the cells. Anthers opening by longitudinal slits.*

Trib. 5. *ASTRONIEÆ.* Ovules numerous. Berry coriaceous or succulent, many-seeded, the seeds minute.

PTERNANDRA. Calyx smooth or scaly, the limb truncate, obscurely 4-lobed. Stamens 8. Trees or shrubs.

Subord. II. MEMECYLEÆ. Ovary 1-celled, with a free central placenta to which 6 or more ovules are attached in a whorl. Berry succulent or coriaceous, 1-seeded. Embryo large, the cotyledons much folded and leafy.

MEMECYLON. Anthers 8, equal. Trees or shrubs, with penninerved or very rarely 3-nerved leaves.

Osbeckia, L.

Conspectus of Species.

* * *Petals* 8. *Stamens* 3.

× Flowers small. Calyx-tube bell-shaped. Anthers short, truncate or abruptly beaked.

Calyx not ribbed, glabrous or more or less covered with long fringed scales; anthers prolonged into a bristle-like beak, ... *O. Chinensis.*

× × Flowers rather large and conspicuous. Calyx-tube elongate urceolate, in fruit produced into a tubular neck overtopping the bristle-crown of the capsule.

Bristly hairy; calyx covered with peltate stellate-bristly scales, the ciliate lobes linear-subulate, alternating with as many minute teeth conform with the lobes; branches 4-cornered, ... *O. crinita.*

Almost glabrous or minutely bristly; calyx sparingly sprinkled with minute ciliate scales, or smooth, the lobes lanceolate, usually ciliate, alternating with minute ciliate teeth; branchlets 4-cornered, ... *O. rostrata.*

* * *Petals* 5. *Stamens* 10.

More or less densely pubescent; petiole very short or the leaves almost sessile; bracts broadly obovate; calyx loosely covered with rotundate fringed scales, .. *O. Nepalensis.*

More or less appressed bristly, the branches much tubercled; petiole ⅔—1 in. long; bracts lanceolate; calyx appressed setose, ... *O. aspericaulis.*

1. O. Chinensis, L. sp. pl. 490; DC. Prod. III. 141; Triana in Linn. Trans. XXVIII. 53. (*O. angustifolia*, Don. Prod. Nep. 221; DC. l. c. 142; Wall. Pl. As. rar. III. t. 251; Naud. in Ann. d. sc. nat. 3 ser. XIV. 69).

Var. *α.* genuina, flowers sessile; calyx-tube not or sparingly ciliate-scaly, about 3 lin. long or longer, the lobes broad, about as long as the tube.

Var. *β.* linearis, (*O. linearis*, Bl. Mus. Lugd. Bat. I. 51; Naud. in Ann. d. sc. nat. 3 ser. XIV. 70 and XIII. t. 7. f. 4; *O. Zeylanica*, DC. Prod. III. 141; Roxb. Fl. Ind. II. 223), calyx somewhat smaller and shorter, almost spherical, more or less covered with long-hairy scales, sometimes (in bud) appearing densely pilose; flowers nearly twice as large, on short pedicels, the calycine lobes shorter and narrower.

Hab. Frequent on grassy or waste places of the plains, and more so in the open forests, all over Pegu.—Fl. Fr. Decb.

2. O. rostrata, Don. Prod. Nep. 221: Trian. in Linn. Trans. XXVIII. 53. (*O. quaterna*, Ham. in Don. l. c. 222).

Var. *α.* pulchella, Triana l. c. 54 (*Melastoma pulchellum*, Roxb. Fl. Ind. II. 403; *O. pulchella*, Bth. ap. Naud. in Ann. d. sc. nat. 3 ser. XIV. 73.), the 4-conered stems and branchlets and leaf-nerves minutely bristly; calyx-tube covered with ciliate scales.

Var. *β.* longicollis, Triana l. c. 54, leaves, the 4-cornered stem and branches glabrous, the latter usually bristly fringed between the petioles; calyx and its lobes quite glabrous, or only the latter ciliate.

? Var. *γ.* ternifolia, Trian. l. c. 54 (*O. ternifolia*, Don. Prod. Nep. 221; DC. Prod. III. 142; Wall. Pl. As. rar. III. 21. t. 239), pretty glabrous, branches 8-cornered, calyx less stellate-bristly, apparently without additional teeth between the lanceolate-linear calyx-lobes.

HAB. Var. α. in Chittagong (Roxb.); not unfrequent on hill-pastures and the drier hill-forests especially the pine-forests, of the Martaban hills, at 3500 to 5000 ft. elevation; var. β. on jungle pastures of the low forests of Pegu; var. γ. Taong-dong and Rangoon, *teste* Triana.—Fl. Decb.; Fr. March—June.

3. O. CRINITA, Bth. ap. Naud. in Ann. d. sc. nat. XIV. 72; Triana. in Linn. Trans. XXVIII. 53 (*Melastoma crinitum*, Roxb. Fl. Ind. II. 402).

HAB. Chittagong (Roxb.); not unfrequent in the drier hill-forests, especially in open grassy places, of the Martaban hills east of Tounghoo, at 4000 to 7000 ft. elevation.—Fr. March.

4. O. NEPALENSIS, Hook. Fl. Exot. t. 31; Naud. in Ann. d. sc. nat. Bot. XIV. 68 and XIII. t. 7. f. 2; Bot. Reg. t. 1475; Triana in Linn. Trans. XVIII. 55.

HAB. Ava, Khakyen hills.—Fr. March.

5. O. ASPERICAULIS, Hf. in Linn. Trans. XXVIII. 55.

HAB. Tenasserim? (Helf. 2244).

Otanthera, Bl.

1. O. BRACTEATA, Korth. Verh. Nat. Gesch. Bot. 235. t. 51; Naud. in Ann. d. sc. nat. 3 ser. XIII. 354: Miq. Fl. Ind. Bat. I. 516; Triana in Linn. Trans. XXVIII. 55.

HAB. Apparently frequent in Tenasserim, from the Attaran district southwards to Mergui.—Fl. Febr.—July.

Melastoma, L.

Conspectus of Species.

× Leaves more or less appressed bristly hairy or pubescent.

+ Calyx covered with closely appressed chaffy scale-like bristles.

Scales of calyx about ⅓ lin. long or longer, often rather broad, the calycine lobes shorter, often only half as long as the tube; leaves usually appressed-strigose on both sides, usually acute, ... *M. Malabathricum.*

Scales of calyx up to a line long, chaffy, ciliate or finely cleft, the calycine lobes about as long as the tube, ovate to lanceolate, acuminate, alternating with as many short subulate teeth; leaves on both sides, or beneath only, softly appressed-pubescent, usually acuminate, ... *M. normale.*

+ + Calyx covered with squarrose more or less spreading scale-like bristles about 2 lin. long.

Leaves softly appressed-pubescent on both sides, ... *M. Houtteanum.*

× × Leaves glabrous, or only with a few scales on the nerves beneath.

Calyx covered with long fine spreading curved bristles, the accessory teeth nearly as long as the calyx-lobes themselves, ... *M. decemfidum.*

1. M. MALABATHRICUM, L. sp. pl. 559; Roxb. Fl. Ind. II. 405; Naud. in Ann. d. sc. nat. 3 ser. XIII. 285; WA. Prod. I. 324; Bot. Reg. t. 672; Wight Ill. I. t. 95; Trian. in Linn. Trans. XXVIII. 59. (*Trembleya rhynanthera*, Griff. Not. Dicot. 677).

Hab. Common in shrubbery and waste places, along river-sides, in savannahs, along borders of forests, &c., all over Burma down to Tenasserim.—Fl. Fr. ∞.

I have no clear idea as to the differences between the various species of this alliance. Bentham reduces all the 40 species enumerated by Naudin (in Ann. d. sc. l. c. 283—293) as "species magis ad *M. Malabathricum* vergentes ideoque difficilius distinguendæ," while Triana keeps most of them distinct without assigning diagnostic characters to them.

N. B. *M. imbricatum*, Wall. (nomen nudum) Trian. in Linn. Trans. XXVIII. 60 = *M. fasciculare*, Naud. in Ann. d. sc. nat. 3 ser. XIII. 288, from Tenasserim or the Andamans (Helf. 2243), is unknown to me.

2. M. normale, Don. Prod. Nep. 220; DC. Prod. II. 145; Naud. in Ann. d. sc. nat. 3 ser. XIII. 289; Triana in Linn. Trans. XXVIII. 60. (*N. Napalense*, Lodd. Bot. Cab. t. 707.)

Hab. Frequent in the drier hill-forests of Martaban, up to 5000 ft. elevation; Ava, Khakyen-hills.

3. M. Houtteanum, Naud. in Ann. d. sc. nat. 3 ser. XIII. 291.

Hab. Here and there in the tropical forests of the eastern slopes of the Pegu Yomah; also Andamans (*teste* Triana); Martaban, from Moulmein southwards (Brandis; Helf. 2241).—Fl. March.

Oxyspora, DC.

Conspectus of Species.

Glabrous; branchings of panicle 4-cornered or 4-winged; bracts &c. persistent; connective without any appendage, ... *O. cernua.*

Stems and petioles often hairy; panicle-branchings terete; bracts very deciduous; connective spurred at the base of the back, ... *O. vagans.*

1. O. cernua, Hf. and Th. ap. Triana in Linn. Trans. XXVIII. 73. (*Melastoma cernua*, Roxb. Fl. Ind. II. 404; *Allozygia cernua*, Naud. in Ann. d. sc. nat. 3 ser. XV. 309. t. 15. f. 5.)

Hab. Chittagong (Roxb.).—Fl. Oct., Nov.; Fr. Febr., March.

Allomorphia, Bl.

Conspectus of Species.

Habit of *A. Griffithii*, the stems, petioles and the 9 strong ribs beneath densely covered with long brownish bristles; calyx-teeth minute, ... *A. hispida.*

Quite glabrous; leaves 5-ribbed; calyx-lobes with a thick wing-like appendage on the back, ... *A. umbellulata.*

1. A. hispida, Kurz in Journ. As. Soc. Beng. 1871. 53.

Hab. Upper Tenasserim (Brandis).

2. A. umbellulata, Hf. in Linn. Trans. XXVIII. 74.

Hab. Tenasserim, Mergui Archipelago, on the island St. Mathia (Helf. 2660).

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NOT TO BE ISSUED

Ochthocharis, Bl.

1. O. Javanica, Bl. Bydr. Nat. Wet. VI. 264 and Mus. Bot. Lugd. Bat. I. 40; Naud. in Ann. d. sc. nat. 3 ser. XV. 307; Miq. Fl. Ind. Bat. I. 556; Trian. in Linn. Trans. XXVIII. 74.

Hab. Tenasserim (Helf. 2277).

Anerincleistus, Korth.

Conspectns of Species.

Calyx softly appressed-pubescent, ... *A. Helferi.*
Calyx very densely and spreadingly hirsute, ... *A. Griffithii.*

1. A. Helferi, Hf. in Linn. Trans. XXVIII. 75.

Hab. Tenasserim (or Andamans?) (Helf. 2304).

2. A. Griffithii, Hf. in Linn. Trans. XXVIII. 75.

Hab. Mergui Archipelago (Griff. 2304).

Sarcopyramis, Wall.

1. S. lanceolata, Wall. in Benn. Pl. Jav. rar. 214. (*S. grandiflora*, Griff. Not. Dicot. 678 t. 639. f. 2.).

Hab. Not unfrequent in dark ravines and along torrents in the damp hill-forests of the Nattoung mountains east of Toungboo, at 6000—7000 ft. elevation; also Ava hills.—Fl. Fr. March.

Sonerila, Roxb.

Conspectus of Species.

* *Capsules terete or trigonously-terete.*

× Anthers elongate.

Annual, 2 ft. high, glabrous or nearly so; leaves narrow-linear, serrulate, .. *S. linearis.*

× × Anthers short.

Annual, about ½ ft. high, puberulous; calyx slightly downy and glandular-hairy, .. *S. stricta.*

* * *Capsules sharply 3-gonous or 3-quetrous.*

× Anthers short.

Small annual, 1—5 in. high, sparingly and spreadingly gland-hairy; leaves 4—8 lin. long, ovate to oval; capsule usually with a few hairs, ... *S. tenera.*

× × Anthers long-acuminate.

+ Caulescent herbs.

† Stem short and very thick, scared.

Quite glabrous; leaves lanceolate, decurrent, 4—7 in. long, ... *S. Brandisiana.*

† † Stems elongate, slender and leafed.

Herb 1—1½ ft. high, sparingly hairy; leaves 3—4 in. long, more or less cordate at the base, decussately opposite; capsules glabrous, ... *S. maculata.*
As preceding, but leaves whorled, ... *S. secunda.*

+ + Scapigerous stemless herbs.

Leaves 5—7-plinerved; calyx 4-toothed; petals oblong, acuminate, ... *S. violæfolia.*
Leaves penni-nerved, ciliate; petals obovate, cuspidate; anthers about a line long, .. *S. nudiscapa.*

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NOT TO BE ISSUED

1. S. LINEARIS, Hf. in Linn. Trans. XXVIII. 76.

HAB. Upper Tenasserim, Moulmein, on the "Gevai" hill, at 3000 ft. elevation (Lobb.).

2. O. STRICTA, Hook. Bot. Mag. t. 4394.

HAB. Tenasserim, Moulmein (Lobb.).

3. S. TENERA, R. Br. in Wall. Cat. 4098; Royle Ill. Him. Pl. 250. t. 45. f. 2; Walp. Nep. II. 124 and V. 685.

HAB. Here and there in the eng and low forests, especially on laterite rocks and old pagodas &c., very rare in the upper mixed forests and on pagodas of the plains, all over Pegu, Martaban and Tenasserim as far south as Tavoy.—Fl. Fr. Decb., Jan.

4. S. BRANDISIANA, Kurz in Journ. As. Soc. Beng. 1871. 53.

HAB. Upper Tenasserim, Thoungyeen (Dr. Brandis).

5. S. PICTA, Korth. Verh. Nat. Gesch. 249. t. 52; Naud. in Ann. d. sc. nat. 3 ser. XV. 26; Bl. Mus. Bot. I. 11; Griff. Not. IV. 676. *teste* Triana.; Miq. Fl. Ind. Bat. I. 564.

HAB. Tenasserim, Mergui, on rocks near Palar (Griff.).—Fl. Octob.

6. S. MACULATA, Roxb. Fl. Ind. I. 177. (*S. angustifolia*, Roxb. l. c. 178; Wall. Pl. As. rar. II. t. 102).

Var. α. GENUINA, all parts sprinkled with hairs; leaves bristly serrulate, usually ovate and equilateral, above elegantly white-blotched.

Var. β. EMACULATA, (*S. emaculata*, Roxb. l. c.), as preceding, but the leaves uniformly green.

Var. γ. ANGUSTIFOLIA, (*S. angustifolia*, Roxb. l. c. 178), leaves usually acute or acuminate at the very unequal base, not blotched, but often purplish coloured beneath.

HAB. Not unfrequent in shady localities, especially on mossy rocks and along rocky streamlets, in the hill-forests, especially the moister ones, of the Martaban hills and of Tenasserim, at 3000 to 5000 ft. elevation.—Fr. March.

7. S. SECUNDA, Wall. Cat. 4094; Benn. Horsf. Pl. Jav. rar. 216; Walp. Rep. V. 685.

HAB. Tenasserim, Tavoy.

8. S. NUDISCAPA, Kurz MS.

HAB. Tenasserim, Mergui (Griff. 2303).

9. S. VIOLÆFOLIA, Hf. in Linn. Trans. XXVIII. 77.

HAB. Tenasserim, Moulmein (Lobb. 356, *teste* Triana).

N. B. *S. Teysmanniana*, Miq. Suppl. Fl. Sumatr. 320 = *S. obliqua*, Korth.

Anplectrum, A. Gray.

1. A. CYANOCARPUM, Triana in Linn. Trans. XXVIII. 84 (*Melastoma cyanocarpum*, Bl. Bydr. 1073; *Dissochæta cyanocarpa*, Bl. Bydr. 243;

Korth. Verh. Nat. Gesch. Bot. 238. t. 56; Naud. in Ann. d. sc. nat. 3 ser. XV. 71; Miq. Fl. Ind. Bat. I. 522.)

HAB. Rare in the tropical forests of Martaban, east of Tounghoo; Tenasserim (Helf. 2290).

Doubtful Species.

1. *A.? barbatum*, Triana in Linn. Trans. XXVIII. 84 (*Melastoma barbatum*, Wall. Cat. 4082).

HAB. Tenasserim, Chappedong (Wall.).

2. *Melastoma cordifolia*, Roxb. Fl. Ind. II. 405.

HAB. Chittagong (Roxb.).

Probably same as *A. cyanocarpum*.

3. *Melastoma curva*, Roxb. Fl. Ind. II. 406.

HAB. Chittagong (Roxb.)

Pternandra, Jack.

Conspectus of Species.

Flowers in small stout almost simple cymes, ... *P. capitellata.*
Flowers in branched rather slender axillary and terminal panicles, ... *P. cærulescens.*

1. P. CAPITELLATA, Jack in Mal. Misc. II. 60; Triana in Linn. Trans. XXVIII. 153.

HAB. Tenasserim (or Andamans?) (Helf. 2279 *teste* Triana).

2. P. CŒRULESCENS, Jack in Mal. Misc. 1822. II. 61 and in Hook. Comp. Bot. Mag. I. 157; Triana in Linn. Trans. XXVIII. 153. (*Ewyckia Jackiana*, Walp. Rep. V. 724; *Apteuxis trinervis*, Griff. Not. Dicot. 672; *Ewyckia paniculata*, Miq. Suppl. Fl. Sumatr. 321).

HAB. Tenasserim (Helf. 2275).

Memecylon, L.

Conspectus of Species.

* *Calyx within without radiate lamella-like nerves, or the nerves very obsolete,* (chiefly Hindustani species).

Leaves sessile or nearly so, opaque, drying yellowish; cymes sessile, umbel-like; calyx conspicuously 4-toothed, ... *M. umbellatum.*

* * *Calyx radiately nerved within, the nerves simple or forked, raised and lamella-like like the gills of a mushroom.*

× Berry ovoid or ovoid-oblong. Cymes and pedicels very short and robust.

Leaves sessile or very shortly petioled, with the base rounded or cordate, *M. cæruleum.*

× × Berry globose, the size of a pea to that of a cherry.

† Cymes short and sometimes reduced. Leaves usually thick coriaceous, without visible lateral nerves or veins, petioled.

Δ Berries the size of a pea or smaller.

† Branchlets more or less terete, sometimes marked with obsolete lines.

O Calyx up to a line in diameter, not tubercled.

Leaves attenuate at the base, very acuminate, glossy; petiole 1—2 lin. long; pedicels hardly a line long, thick; cymes very short, almost sessile, ... *M. lævigatum.*

Leaves attenuate at the base, sharply acuminate; pedicels 1—1½ lin. long; umbel-like cymes shortly peduncled, ... *M. plebejum.*

O O Calyx about 1½ lin. across, tubercled.

Pedicels short and thick; calyx undulate-truncate with a hemispherical tubercled base; leaves bluntish or retuse, shortly acuminate, ... *M. punctatum.*

† † Branchlets sharply 4-lined or almost 4-winged and appearing more or less 4-cornered.

Calyx smooth, about 1½ lin. across, expanded, obsoletely undulate-lobed; cymes almost sessile or shortly peduncled; leaves as in preceding species, ... *M. scutellatum.*

Calyx about ½ lin. wide, sharply 4-toothed; leaves only ½—1½ in. long; pedicels about a line long; cymes much reduced, almost sessile, few-flowered, ... *M. pauciflorum.*

△ △ Berries the size of a cherry, sappy.

.. *M. cerasiforme.*

+ + Cymes more or less ample, peduncled. Berries the size of a pea or smaller,

+ Leaves rather thin-coriaceous, the lateral nerves more or less conspicuous and arcuately anastomosing towards the margin.

Cymes simple, the pedicels slender; calyx 1—1½ lin. wide. Leaves those of *M. cerasiforme,* .. *M. celastrinum.*

Umbellets in thyrsoid cymes, the pedicels 1—2 lin. long; calyx ⅔ lin. wide, the limb sinuate 4-angular, ... *M. Griffithianum.*

† † Leaves more or less thick-coriaceous, the lateral nerves not or barely visible.

O Leaves sessile, with a cordate base.

Leaves large; cymes lax, peduncled, rather slender: pedicels 2—3 lin. long, slender, .. *M. pulchrum.*

O O Leaves petioled, more or less tapering, very rarely rounded, at the base.

△ Branchlets sharply 4-cornered. Leaves tapering at base.

Cymes rather short-peduncled, but slender; leaves 3—4 in. long, ... *M. elegans.*

△ △ Branchlets terete or with only faint lines.

Leaves attenuate at the base, blunt or retuse, almost opaque when dried; petiole 1—2 lin. long; pedicels ½—1 lin. long, slender; cymes simple, peduncled, .. *M. ovatum.*

Leaves rounded at the base, smooth and shining; petiole 2—4 lin. long; pedicels 2—3 lin. long; cymes simple or compound, peduncled, ... *M. edule.*

1. M. UMBELLATUM, Burm. Thes. Zeyl. t. 31 and Fl. Ind. 87; Bth. Fl. Austr. III. 293; Triana in Linn. Trans. XXVIII. 159; Bedd. Fl. Sylv. t. 206 (*M. tinctorium*, Koen. in Willd. sp. pl. II. 347; Wight Ill. I. 215. t. 93; *M. ramiflorum*, Lamk. Dict. IV, 88; DC. Prod. III. 6. *ex parte*).

HAB. In the tropical forests of Boronga island opposite Akyab, Arracan.

2. M. CŒRULEUM, Jack in Mal. Misc. I. No. V. 26; Triana in Linn. Trans. XXVIII. 158; Miq. Fl. Ind. Bat. I. 580 (*M. lutescens*, Presl Epim. Bot. 208; *M. Manillanum*, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 276; Miq. Fl. Ind. Bat. I. 576).

Var. α. GENUINA, berries ellipsoid-oval, nearly 5 lin. long; leaves almost sessile, acute.

Var. β. FLORIBUNDUM, (*M. floribundum*, Bl. Mus. Lugd. Bat. I. 361; *M. laurifolium*, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 277; Miq. Fl. Ind. Bat. I. 576.), berries ellipsoid-oval, up to 5 lin. long; leaves rounded at the base, usually acute, on a petiole 1—1½ lin. long.

Var. γ. GRIFFITHIANA, (*M. cordatum*, Griff. Not. Dicot. 673), berries ellipsoid-globose, about 3—4 lin. in diameter; leaves often retuse or blunt with a mucro, almost sessile.

Hab. Var. γ. apparently frequent in Tenasserim, from Moulmein down to Mergui.—Fl. Jul. Aug.; Fr, March.

3. M. LÆVIGATUM, Bl. Mus. Bot., I. 358; Miq. Fl. Ind. Bat. I. 576; Triana in Linn. Trans. XXVIII. 157. (*M. pachyderma*, Wall. Cat. 4104).

Hab. Tenasserim (Helf. 2328); ib. Tavoy (Wall. Cat. 4104).—Fr. Octob.

4. M. PLEBEJUM, Kurz in Pegu Rep. App. B. 53.

Hab. Not unfrequent in the swamp-forests of the Irrawaddi in Pegu; Upper Tenasserim, Thoungyeen (Brandis); Ava, Bhamo (J. Anderson).

5. M. PUNCTATUM, Presl. Bot. Bemerk. 67; Walp. Ann. I. 303.

Hab. Tenasserim (Helf. 2330).

6. M. SCUTELLATUM, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 282; Triana in Linn. Trans. XXVIII. 157.

Var. α. SUBSESSILE, umbellets on peduncles less than a line long or almost sessile; pedicels about a line long; leaves smaller.

Var. β. BREVI-PEDUNCULATUM, umbellets on peduncles 1 to 2 lin. long, the pedicels usually 2 lin. long; leaves larger.

Hab. Var. α. in the adjoining provinces of Siam; var. β. apparently frequent in Tenasserim, from Moulmein southwards; also Pegu, above Rangoon.—Fl. Apr.—June; Fr. Febr.—May.

7. M. PAUCIFLORUM, Bl. Mus. Bot. I. 356; Miq. Fl. Ind, Bat. I. 578; Triana in Linn. Trans. XXVIII. 158.

Hab. Not unfrequent in the tropical forests of the Andamans; Tenasserim (Helf. 2332), Amherst (Falconer); Chittagong (Hf. and Th.),—Fl. Begin of RS.

8. M. CERASIFORME, Kurz For. Fl. Burm. I. 516.

Hab. In the forests of Chittagong (Dr. Schlich).—Fr. CS.

9. M. CELASTRINUM, Kurz in Pegu Rep. App. B. 53 and For. Fl. Burm. I. 515.

Var. α. GENUINUM, leaves glaucous-green, coriaceous; cymes stiff-peduncled.

? Var. β. BRANDISIANUM, leaves of a thinner texture, more (often caudately) acuminate; cymes short or very short, simple or the lateral branchings almost reduced; peduncles 2—4 lin. long, pedicels more slender.

HAB. Var. α. Not unfrequent in the tropical forests of Martaban, rare in those of the eastern slopes of the Pegu Yomah; var. β. in the tropical forests of Upper Tenasserim, (Brandis, Falconer, Helf. 2335).—Fl. Febr.—Apr.; Fr. Jan.

10. M. GRIFFITHIANUM, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 274. (*M. Horsfieldii*, Miq. in Fl. Ind. Bat. I. 572; *M. Lampongum*, Miq. Suppl. Fl. Sumatr. 321 ?).

HAB. Tenasserim (Helf. 2331); in the tropical forests of the Martaban hills east of Toughoo.

11. M. PULCHRUM, Kurz in Journ. As. Soc. Beng. 1872. 307.

HAB. Not unfrequent in the tropical forests of the Andamans.—Fl. Begin of May.

12. M. ELEGANS, Kurz in Journ. As. Soc. Beng. 1872. 307.

HAB. Rather frequent in the tropical forests of the Andamans.—Fl. May.

13. M. OVATUM, Smith in Rees. Cycl. V. 23. No. 3.; DC. Prod. III. 6. (*M. grande*, Wall. Cat. 4109; *M. lucidum*, Presl Epim. Bot. 209; *M. prasinum*, Naud. in Ann. d. sc. nat. 3 ser. XVIII. 275).

HAB. Not unfrequent in the tropical forests from Martaban down to Tenasserim; also Chittagong.—Fl. Nov.—Febr.

14. M. EDULE, Roxb. Corom. Pl. I. 82; DC. Prod. III. 6; Triana in Linn. Trans. XXVIII. 158. (*M. edule*, var. γ. Thw. En. Zeyl. Pl. 110 and CP. 1563; *M. ramiflorum*, Griff. Not. Dicot. 673).

HAB. Not unfrequent in the tropical forests of the Andamans and the Cocos islands; also Tenasserim (Helf. 2329).—Fl. Apr.—May; Fr. June.

The genus *Memecylon* is in need of a thorough revision. The species are extremely difficult of correct identification without access to the very authentic specimens for the most part deposited in European herbaria and hence inaccessible to the Indian botanist. Triana's account of the genus is barely more than a compilation. I have, therefore, kept the Burmese forms all separate pending a comparison and identification of the same with those already described.

LYTHRARIEÆ.

Conspectus of Species.

* *Capsule irregularly or circumsciss-dehiscing, or 2-valved,* 1—4-*celled.*

× Seeds glabrous. Leaves not black dotted.

† Flowers with petals, or rarely apetalous in some herbs.

O Herbs. Capsule 1—5-celled, irregularly or transversely dehiscing.

Ammannia. Calyx 3—5-toothed. Stamens 2—8. Disk-glands none. Leaves opposite or rarely whorled.

Hydrolythrum. Calyx 4-lobed. Petals 4. Stamens 4. Disk-glands 8. Capsule 2-celled. Aquatics, with whorled leaves.

O O Trees or shrubs.

Pemphis. Calyx 12-toothed, ribbed. Petals 6. Stamens 12. Ovary 3-celled. Capsule 1-celled, transversely circumsciss.

Lawsonia. Calyx 4-parted. Petals 4. Stamens 8. Ovary and capsule 4-celled, the latter irregularly bursting.

† † Flowers apetalous. Trees or shrubs.

Crypteronia. Calyx 4—5-cleft. Stamens 4—5. Ovary and capsule 2-celled, the latter 2-valved.

Dichotomanthes. Calyx 5-toothed, terete, the teeth alternating with as many accessory minute ones. Stamens 10. Capsule woody, indehiscent ?, 1-celled.

× × Seeds pilose. Calyx-tube tubular, curved. Stamens declinate. Leaves black-dotted beneath.

Woodfordia. Calyx 6-lobed. Petals 6, or none. Stamens 12, long-exserted. Ovary and capsule 2-celled, the latter elongate, sessile, loculicidally 2-valved.

* * *Capsule regularly opening into* 3—8 *valves, or berry-like and indehiscent. Trees or shrubs.*

× Capsule dry or leathery, dehiscent.

Lagerstrœmia. Calyx bell-shaped, 4—6- rarely 7-cleft. Petals 4—6. Stamens numerous, in 2 or more rows. Capsule dry, almost woody, 3—6-celled and -valved. Seeds laterally winged.

Duabanga. Calyx 4—7-parted, thick coriaceous. Petals 4—7. Stamens numerous, in a single row. Capsule leathery, 4—8-celled and -valved. Seeds appendaged at both ends.

× × Capsule berry-like, indehiscent.

Sonneratia. Calyx bell-shaped, 4—8-lobed. Petals 4—8, or none. Stamens numerous. Berry many-celled.

Ammannia, L.

Conspectus of Species.

Subg. 1. *Rotala*, L. Flowers solitary (rarely and only occasionally by 2 or 3) in the axils of the leaves, or bracts, often forming spikes or racemes. Capsule 2—4-valved.

* *Disk-glands* 8 *under the ovary.* (Hydrolythrum, Hf.).

Aquatic herb of the habit of *Myriophyllum*, the leaves whorled, linear, ... *A. Wallichii.*

* * *Disk-glands absent.* (Rotala, L.).

× Calyx bell-shaped, thrice as deep as wide. Capsule shorter than, and included in, the calyx-tube.

Leaves very shortly petioled, 1-nerved, linear; flowers solitary, sessile; pygmæan annual, ... *A. dentelloides.*

Leaves usually sessile, strongly penninerved, obovate to oblong; flowers sessile, forming lateral and terminal leafy or bracted spikes, ... *A. peploides.*

Leaves sessile, almost orbicular, penninerved; flowers shortly and slenderly pedicelled, forming shorter or longer slender racemes, ... *A. subrotunda.*

Leaves sessile, orbicular or nearly so, penninerved; flowers sessile, in terminal peduncled bracted simple or compound spikes, ... *A. rotundifolia.*

× × Calyx hemispherical, about as deep as wide; capsule protruded from, or at least as long as, the calyx-tube.

Leaves linear, 1-nerved, very shortly petioled; calyx 4-angular, 4-toothed, about $\frac{1}{4}$—$\frac{1}{8}$ lin. long; petals none; pygmæan herb, ... *A. pygmæa.*

Leaves oblong to linear-oblong, 1-nerved, very shortly petioled; calyx short, 4-toothed, about $\frac{1}{3}$ lin. long; flowers very shortly pedicelled; pygmæan herb, .. *A. simpliciuscula.*

Leaves oblong to linear, sessile, 1-nerved, or the lateral nerves very faint; calyx usually 5-toothed, $\frac{1}{2}$—1 lin. long; petals 5, ... *A. pentandra.*

Subg. 2. *Ammannia*, L. Flowers pedicelled or rarely sessile, axillary, clustered or in cymes, the latter sometimes reduced to 1 or a few flowers only. Capsule irregularly bursting.

× Leaves narrowed at the base, petioled or sessile.

Flowers minute, apetalous, on slender pedicels, forming sessile or very shortly peduncled cymes or clusters, ... *A. baccifera.*

× × Leaves sessile, with a cordate, sagittate or dilated base. Petals present.

Capsule under a line long; stamens 4, or fewer; petals not crumpled; calyx 4-toothed, without accessory teeth; cymes slender, ... *A. multiflora.*

Capsule about $1\frac{1}{2}$ lin. long; stamens 6—8; petals not crumpled; calyx 4-toothed without accessory teeth; cymes slender, ... *A. auriculata.*

Capsule about 2 lin. long; stamens 8; petals large, crumpled; calyx 4-toothed with as many horn-shaped accessory teeth; cymes and pedicels short, stout, *A. octandra.*

1. A. Wallichii, (*Hydrolythrum Wallichii*, Hf. in Bth. and Hf. Gen. Pl. I. 777, and in Hook. Icon. pl. t. 1007).

Hab. Tenasserim, Tavoy (Gomez).

2. A. dentelloides, Kurz in Journ. As. Soc. Beng. 1870. 76.

Hab. Not-unfrequent in wet pastures and rice-fields of Arracan.—Fl. Fr. Sept., Octob.

3. A. peploides, Spreng. Syst. Veg. I. 444 (1825). (*Peplis Indica*, Willd. Sp. pl. II/1. 244; Poir. in Lamk. Enc. V. 162; *A. repens*, Rottl. ex Mart. in Acad. Muench. VI. 150; DC. Prod. III. 80; *Ameletia Indica*, DC. in Mem. Soc. Genev. III/2. 82. t. 3. f. A. and Prod. III. 76; WA. Prod. I. 303; Wight Icon. t. 257. A.; Bl. Mus. Lugd. Bat. II. 135; *Ameletia elongata*, Bl. l. c.; *Ameletia acutidens*, Miq. Fl. Ind. Bat. 1/1. 617; *A. nana*, Roxb. Fl. Ind. I. 427, non DC.).

Hab. Common in wet pastures and fallow rice-fields, along river-banks, around swamps, &c., all over Burma and the adjoining provinces.—Fl. Fr. Nov.—March.

4. A. SUBROTUNDA, Wall. Cat. 2096; Kurz in Journ. As. Soc. Beng. 1871. 55.

HAB. Ava, from Segain and Mandalay northwards in the Irrawaddi valley.—Fl. Fr. Jan.

5. A. ROTUNDIFOLIA, Buch. in Roxb. Fl. Ind. I. 425; DC. Prod. III. 79; WA. Prod. I. 306. (*Ameletia rotundifolia*, Wight Ill. I. 206 and Icon. t. 258).

HAB. Ava, Irrawaddi valley about Bhamo &c.; also Kakhyen hills.—Fl. Febr. March.

6. A. PYGMÆA, Kurz in Seem. Journ. Bot. 1867. 376.

HAB. On gravel-roads, sandy grounds &c., of the eng-forests along the western slopes of the Pegu Yomah, and no doubt elsewhere.—Fl. Fr. Nov.

7. A. SIMPLICIUSCULA, Kurz in Journ. As. Soc. Beng. 1871. 54.

HAB. On mud around ponds and in rice-fields in Chittagong.—Fl. Fr. Octob.

8. A. PENTANDRA, Roxb. Fl. Ind. I. 427 (1820); DC. Prod. III. 79, in part; WA. Prod. I. 305, in part; Bl. Mus. Lugd. Bat. II. 134. t. 46. f. B. (*Rotala Roxburghiana*, Wight Icon. t. 260. B.; Walp. Rep. II. 101; *Sellowia uliginosa*, Roth. Nov. sp. 163 (1821); DC. Prod. III. 380; *Tritheca pentandra*, Miq. Fl. Ind. Bat. I/1. 614.; *A. nana*, DC. Prod. III. 79, non Roxb.; *Rotala decussata*, DC. l. c. 76).

HAB. Frequent in wet pastures, rice-fields, along river-banks, &c., all over Burma, especially in cultivated lands.—Fl. Fr. Close of RS.

9. A. BACCIFERA, L. sp. pl. 175; Bl. Mus. Bot. Lugd. Bat. II. 133. (*A. vesicatoria*, Roxb. Fl. Ind. I. 426; DC. Prod. III. 78; WA. Prod. I. 305; *A. Indica*, Lamk. Ill. I, 311. No. 1555; DC. Prod. III. 77, in part; WA. Prod. I. 305, in part; Bth. Fl. Austr. III. 297; Bl. Mus. Lugd. Bat II. 133. t. 46. f. A: *Cryptotheca apetala*, Bl. Bydr. 1128; DC. Prod. III. 76; *Hapalocarpum vesicatorium* and *H. Indicum*, Miq. Fl. Ind. Bat. I/1, 618).

HAB. Common in cultivated lands, in fallow rice-fields, on road-sides, along river-banks, lakes, &c., in open as well as in forest-land, all over Burma, up to 2000—3000 ft. elevation.—Fl. Fr. Nov.—May.

10. A. MULTIFLORA, Roxb. Fl. Ind. I. 426; DC. Prod. III 79; WA. Prod. I. 305. (*Cryptotheca dichotoma*, Bl. Mus. Bot. Lugd. Bat. II. 130. t. 44?; *A. microcarpa*, DC. Prod. III. 78?; *Suffrenia dichotoma*, Miq. Fl. Ind. Bat. I/1, 616).

HAB. Chittagong, in rice-fields and cultivated lands.—Fl. Fr. Octob.

11. A. AURICULATA, Willd. Hort. Berol. I. 7. t. 7; DC. Prod. III. 80; Bth. Fl. Austr. III. 297.

HAB. Chittagong, in rice-fields.—Fl. Fr. Octob.

12. A. OCTANDRA, L. f. Suppl. 127; Roxb. Corom. Pl. II. 18. t. 133 and Fl. Ind. I. 425; WA. Prod. I. 304; Bl. Mus. Lugd. Bat. II. 132. (*Amanella linearis*, Miq. Fl. Ind. Bat. I/1, 619; *Diplostemon octandrum*, Miq. l. c. 615).

HAB. Rice-fields in Chittagong.—Fl. Fr. Octob.

Pemphis, Forst.

1. P. ACIDULA, Forst. Gen. t. 34; DC. Prod. III. 89; Bl. Mus. Bot. Lugd. Bat. II. 128. t. 43; WA. Prod. I. 307; Griff. Not. Dicot. 510, (*P. angustifolia*, Roxb. Fl. Ind. II. 465; *Maclellandia Griffithiana*, Wight Icon. t. 1996).

HAB. Rocky coasts all along Tenasserim and Andamans.—Fl. Fr. Octob. and Apr.

Lawsonia, L.

1. T. INERMIS, L. sp. pl. 498; Roxb. Fl. Ind. II. 258; Griff. Not. Dicot. 509. t. 590. f. 2. (*L. alba*, Lamk. Dict. III. 106; DC. Prod. III. 91; WA. Prod. I. 307; Wight Ill. I. t. 94; *L. spinosa*, L. sp. pl. 498).

HAB. Much cultivated all over Burma, and sometimes like wild around villages and in cleared lands.—Fl. Fr. nearly ∞.

Crypteronia, Bl.

Conspectus of Species.

Calyx about ⅓ lin. across; leaves usually puberulous beneath, ... *C. pubescens.*
Calyx 1—1½ lin. in diameter; leaves quite glabrous, ... *C. paniculata.*

1. C. PANICULATA, Bl. Bydr. 1151 and Mus. Bot. Lugd. Bat. II. 123. t. 42. (*Henslovia paniculata*, Miq. Fl. Ind. Bat. I/1, 716; *Henslovia affinis*, Planch. in Hook. Lond. Journ. IV. 477; Miq. l. c.).

Var. *a.* GLABRA, (*Henslovia glabra*, Planch. in Hook. Lond. Journ. IV. 478; *Crypteronia paniculata*, Bl. l. c.), rhachis of racemes glabrous, at least in fruit.

Var: *β.* PUBESCENS, (*Henslovia pubescens*, Griff. Not. Dicot. 404. t. 564. f. 2., non Planch.). rhachis of racemes densely puberulous, not glabrescent.

HAB. Var. *a.* in Chittagong; var. *β.* frequent in the tropical forests, especially the open ones, also in the moister upper mixed forests, from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. Nov.—Jan.; Fr. Febr.—May.

Woodfordia, Salisb.

1. W. FRUTICOSA, (*Lythrum fruticosum*, L. sp. pl. 641; *Woodfordia floribunda*, Salisb. Parad. Lond. t. 42; *Grislea tomentosa*, Roxb. Corom. Pl. I. 29. t. 31. and Fl. Ind. II. 233; Bot. Reg. I. t. 40; Bot.

Mag. t. 1906; DC. Prod. III. 92; WA. Prod. I. 308; Bl. Mus. Lugd. Bat. II. 128).

Var. *α.* GENUINA, more or less greyish or silvery appressed pubescent.

Var. *β.* PUNCTATA, Bl. Mus. Bot. Lugd. Bat. II. 128 (*Grislea punctata*, Ham. in Rees. Cycl. V. 17. No. 2.; DC. Prod. III. 92; WA. Prod. I. 308), leaves shortly petioled, almost glabrous.

HAB. Var. *α.* frequent in the dry forests of the Prome District; rare in the drier upper mixed forests of Pegu; Ava, Kakhyen hills.—Fl. Fr. Jan., Febr.

Lagerstrœmia, L.

Conspectus of Species.

Subg. 1. *Sibia*, DC. Calyx terete, without ribs or furrows.

* *Inflorescence and calyx glabrous.*

Leaves whitish glaucous beneath; flowers hardly $\frac{1}{2}$ in. across, ... *L. parviflora.*

Leaves green; flowers $1\frac{1}{2}$—2 in. in diameter, ... *L. Indica.*

* * *Inflorescence and calyx covered with a rusty coloured tomentum.*

Flowers almost racemose, in panicles; calyx by $\frac{1}{2}$ or $\frac{2}{3}$ shorter than the capsule, ..*L. calyculata.*

Subg. 2. *Adambea*, Lamk. Calyx furrowed, plaitedly ribbed or angular, the angles acute or almost winged.

* *Ribs or angles twice as many as calyx-lobes, the shorter alternating ones terminating at the sinuses of the lobes, those of the longer ones extending over the lobes. Petals large.*

+ Inflorescence and calyx covered with a floccose tomentum. Calyx-lobes terminating in a bristle or short mucro.

Adult leaves glabrous, acuminate; tomentum rusty-coloured; petals on short claws, not fringed, ... *L. floribunda.*

Adult leaves puberulous beneath, acuminate; tomentum whitish or yellowish; petals on long slender claws, ciliolate, ... *L. tomentosa.*

As preceding, but leaves mucronate or acute; flowers twice as large; petals conspicuously fringed, ... *L. Loudoni.*

× × Inflorescence and calyx pruinous, or minutely whitish or greyish puberulous, all other parts glabrous.

Leaves whitish glaucous beneath; calyx 10—12-angular, the angles acute, ..*L. hypoleuca.*

Leaves green; calyx plicately-sulcate, the ribs very obtuse and broader than the furrows, ... *L. flos-reginæ.*

Leaves green; calyx longitudinally furrowed, without ribs, ... *L. macrocarpa.*

* * *Angles of calyx as many as plain lobes and alternating with them. Petals minute.*

All softer parts greyish pubescent; angles of calyx almost winged; flowers small, ..*L. villosa.*

1. L. PARVIFLORA, Roxb. Corom. Pl. I. 28. t. 66. and Fl. Ind. II. 505; Wight Icon. t. 69; Griff. Not. Dicot. 510. t. 592; DC. Prod. III. 93; Bedd. Fl. Sylv. t. 31.

HAB. Ava.—Fl. April.

*2. L. Indica, L. sp. pl. 734; Bot. Mag. t. 405; Roxb. Fl. Ind. II. 505; WA. Prod. I 308; Wight Ill. I. t. 86; Bl. Mus. Lugd. Bat. II. 125; Miq. Fl. Ind. Bat. I/1, 622.

Hab. Generally planted in villages, but nowhere wild; (apparently wild in the Yunan-hills).—Fl. May, June.

3. L. calyculata, Kurz in Journ. As. Soc. Beng. 1872. 307.

Hab. Rather rare in the tropical forests of Martaban east of Tounghoo.—Fr. March, April.

4. L. floribunda, Jack in Mal. Misc. I. 38; DC. Prod. III. 93; Miq. Fl. Ind. Bat. I/1, 624; Bl. Mus. Lugd. Bat. II. 126. t. 41; Griff. Not. Dicot. 509.

Hab. In the tropical forests along the Salween in Martaban and in Tenasserim from Moulmein southwards; also Andamans.—Fl. July, Aug.

5. L. tomentosa, Presl Bot. Bemerk. 142; Walp. Ann. I. 295.

Hab. Frequent in the tropical and moister upper mixed forests, all over Pegu and Martaban down to Tenasserim.—Fl. April, May; Fr. May, June.

6. L. Loudoni, Teysm. and Binend. in Natuurk. Tydsch. Ned. Ind. XXIV. 331.

Hab. In the adjoining Siamese province of Kanbooree, in eng-forests. —Fl. HS.

7. L. hypoleuca, Kurz in Journ. As. Soc. Beng. 1872. 307.

Hab. Frequent in the tropical and moister upper mixed forests of the Andamans.—Fl. June, July; Fr. CS.

8. L. flos-reginæ, Retz. Obs. Bot. I. 20. (1779). (*L. Reginæ*, Roxb. Corom. Pl. I. 46. t. 65. (1795). and Fl. Ind. II. 505; DC. Prod. III. 93; Bl. Mus. Lugd. Bat. II. 126. t. 41; WA. Prod. I. 308; Wight Icon. t. 413; Miq. Fl. Ind. Bat. I/1, 623; Bedd. Fl. Sylv. t. 29; *Adambea glabra*, Lamk. Encycl. Bot. I. 39. (1783); *Ketmia Indica*, Burm. Thesaur. Zeyl. 137. (1737) non L.).

Hab. Common in the mixed forests and savannahs all over Burmah and the adjacent provinces.—Fl. HS.; Fr. CS.

9. L. macrocarpa, Wall. Cat. 2114; Voigt Hort. Calc. 132.

Hab. Frequent in the open, especially the low, forests, from Ava, Pegu and Martaban down to Tenasserim.—Fl. HS.; Fr. CS.

10. L. villosa, Wall. in Journ. As. Soc. Beng. 1873. 234.

Hab. Not unfrequent in the tropical and moister upper mixed forests of the Pegu Yomah and Martaban.—Fl. June.

Duabanga, Ham.

1. D. grandiflora, (*Lagerstrœmia grandiflora*, Roxb. Hort. Beng. 38 and Fl. Ind. II. 503; DC. Prod. III. 93; Bl. Mus. Lugd. Bat. II.

125; *D. sonneratioides*, Buch. in Linn. Trans. XVII. 178; Hf. Illustr. Him. Pl. t. 11; Walp. Ann. II. 540; *Leptospartion grandiflorum*, Griff. Not. Dicot. 511. t. 591).

HAB. Frequent in the mixed forests, especially the upper ones, also in the tropical forests, all over Burmah, from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. March, April; Fr. May.

Sonneratia, L. f.

Conspectus of Species.

* *Stigma infundibuliform-capitate, small.*
× Petals linear-lanceolate, dark purple.
Calyx terete, 6—8-lobed; leaves obovate, broad, ... *S. acida.*
× × Petals none.
Calyx in bud elliptically oblong, acute, the tube at first obscurely, then strongly 6—8-angular, ... *S. alba.*
Calyx in bud ovoid, obtuse, the tube terete, ... *S. Griffithii.*
* * *Stigma large, nearly 3 lin. in diameter, conically umbrella-shaped.*
Calyx 4-lobed; petals none; leaves oblong to lanceolate, ... *S. apetala.*

1. S. ACIDA, L. f. Suppl. 252; DC. Prod. III. 235; Roxb. Fl. Ind. II. 506; WA. Prod. I. 327; Wight Icon. t. 340; Griff. Not. Dicot. 652; Miq. Fl. Ind. Bat. I/1, 496.

HAB. Frequent in the littoral forests all along the coasts, from Chittagong down to Tenasserim and the Andamans.—Fl. H. and RS.; Fr. CS.

2. S. ALBA, Smith in Rees Cycl. V. 23; DC. Prod. III. 231; Miq. Fl. Ind. Bat. I/1, 497. (*Mangium album*, Rumph. Herb. Amb. III. 111. t. 73).

HAB. On the sea-shore of the Andamans.—Fl. April, May.

3. S. GRIFFITHII, Kurz in Journ. As. Soc. Beng. 1871. 56. (*S. alba*, Griff. Not. Dicot. 652.)

HAB. Frequent in the littoral, especially the tidal forests of Pegu and Tenasserim.—Fl. April, May.

4. S. APETALA, Buch. in Sym. Emb. to Ava III. 313. t. 25; DC. Prod. III. 231; WA. Prod. I. 327; Roxb. Fl. Ind. II. 506; Griff. Not. Dicot. 650. t. 636. f. 4.

HAB. Common in the tidal forests, less so in the mangrove swamps, all along the coasts from Chittagong down to Tenasserim; Ava (Mrs. Burney) is there no mistake?—Fl. June, July; Fr. RS.

GRANATEÆ.

Punica, L.

*1. P. GRANATUM, L. sp. pl. 676; DC. Prod. III. 3; WA. Prod. I. 327; Roxb. Fl. Ind. II. 499; Bot. Mag. t. 1832. AB.; Wight Illust. II. t. 97; Griff. Not. Dicot. 641. t. 634.

HAB. Ava, much planted from Mandalay northwards.—Fl. Jan., Febr.

ONAGRARIEÆ.

Conspectus of Species.

* *Ovary 2—6-celled, the cells many-ovuled. Capsules dehiscing loculicidally or septicidally, many-seeded. Usually terrestrial herbs.*

JUSSIÆA. Stamens twice as many as petals. Ovary 4-celled. Capsule septicidal.

LUDWIGIA. Stamens as many as petals. Ovary 3—6-celled. Capsule septicidal.

* * *Ovary 1—4-celled, the cells 1- (rarely 2—4-) ovuled. Nut 1—4-celled, 1—4-seeded.*

TRAPA. Flowers 4-merous. Ovary 2-celled. Nuts with 2 or 4 spines or horns. Floating herbs.

Jussiæa, L.

Conspectus of Species.

Creeping or floating herb; flowers usually 5-merous, white, long-pedicelled; seeds large, spongy, ... *J. repens.*

Erect, terrestrial; flowers mostly 4-merous, very shortly pedicelled or almost sessile; seeds minute, crustaceous, glossy, ... *J. suffruticosa.*

1. J. REPENS, L. sp. pl. 550 and Mant. 381; DC. Prod. III. 54; WA. Prod. I. 335; Roxb. Fl. Ind. II. 401; Rheed. Hort. Malab. II. t. 51. (*J. Swartziana*, DC. l. c.; *J. floribunda*, Griff. Not. Dicot. 680).

Var. *α.* GLABRIUSCULA, all parts more or less glabrous; peduncles smooth; ovary puberulous or almost glabrous.

Var. *β.* VESTITA, all parts, more especially the peduncles, more or less softly hairy or pubescent; ovary more or less woolly.

HAB. Both forms frequent in and around ponds, lakes, swamps, &c., also in rice-fields and quietly running streams, all over Burma down to Tenasserim.—Fl. Jan. to April; Fr. April, May.

2. J. SUFFRUTICOSA, L. sp. pl. 555; Miq. Fl. Ind. Bat. I/1, 628; Bth. Fl. Austr. III. 307.

Var. *α.* GENUINA, (*J. angustifolia*, Lamk. Dicot. III. 331 and Ill. t. 280. f. 3; DC. Prod. III. 55; *J. exaltata*, Roxb. Fl. Ind. II. 401; *J. suffruticosa*, L. l. c.; *J. Blumeana*, DC. Prod. III. 331; Miq. Fl. Ind, Bat. I/1, 627; *J. longipes*, Griff. Not. Dicot. 689; *J. Burmanni*, DC. l. c. 57), all parts simply appressed pubescent or almost glabrous, the capsules narrower.

Var. *β.* VILLOSA, Miq. Fl. Ind. Bat. I/1, 628 (*J. villosa*, Lamk. Encycl. Méth. III. 331; DC. Prod. III. 57; WA. Prod. I. 336; *J. fruticosa*, DC. l. c.; Rheed. Hort. Malab. II. t. 50.), all parts more densely villous, the capsules usually thicker and more pubescent.

HAB. Both varieties common on mud-banks of rivers, around tanks, in swamps and rice-fields, &c., all over Burma down to Tenasserim.—Fl. Fr. March—May.

Ludwigia, L.

Conspectus of Species.

Capsules from oblong to elongate-cylindrical, thick; seeds densely covering the placentas, ... *L. parviflora.*
Capsules almost filiform; seeds in a single row, ... *L. prostrata.*

1. L. PARVIFLORA, Roxb. Fl. Ind. I. 419; Schlechtd. in Coroll. Obs. Hort. Hal. 1854 and in Linn. XXVI. 479; Wight Ill. t. 101; WA. Prod. I. 336; DC. Prod. III. 59. (*L. perennis*, Miq. Fl. Ind. Bat. I/1, 629, non L.; *L. gracilis*, Miq. l. c.).

Var. *α.* ROXBURGHIANA, (*L. parviflora*, Roxb. l. c., &c.,) capsules sessile or nearly so, 4—6 in. long; calyx-lobes only half as long as the calyx-tube.

Var. *β.* LYTHROIDES, (*L. lythroides*, Bl. Bydr. 1134; DC. Prod. III. 59), capsules distinctly pedicelled, from obovate to almost turbinate or oblong, about 2—3 lin. long; calyx-lobes as long as the calyx-tube.

HAB. Var. *α.* here and there in Pegu and Martaban, along the larger rivers, as the Sittang &c.; var. *β.* frequent on mud-banks, in swampy places and rice-fields, around tanks and lakes, &c., all over Burma down to Tenasserim and the Andamans.—Fl. Fr. Sept.—May.

2. L. PROSTRATA, Roxb. Fl. Ind. I. 420; DC. Prod. III. 59; Wight Icon. t. 762. (*L. diffusa*, Ham. in Linn. Trans. XIV. 301; DC. l. c.; *Nematopyxis fruticulosa*, *pusilla* and *prostrata*, Miq. Fl. Ind. Bat. I/1. 630).

Var. *α.* LUXURIANS, plant erect and branched, the leaves much larger.

Var. *β.* HUMIFUSA, small, prostrate; leaves small, usually not above ½ in. long, more or less blunt.

HAB. Var. *α.* not unfrequent in wet places in Pegu and the Andamans; also Ava; var. *β.* on wet sand-banks of rivers, as the Toukyeghat river.—Fl. Fl. H. and RS.

Trapa, L.

Conspectus of Species.

Nut with 2 opposite reflexed bearded spines, ... *T. bispinosa.*
Nut with 2 pairs of opposite spines, ... *T. quadrispinosa.*

1. T. BISPINOSA, Roxb. Corom. Pl. III. t. 234 and Fl. Ind. I. 428; DC. Prod. III. 64; WA. Prod. I. 337; Rheed. Hort. Malab. XI. t. 33; Miq. Fl. Ind. Bat. I/1. 636).

HAB. In tanks of Chittagong; also Ava.

SAMYDACEÆ.

Conspectus of Species.

Trib. I. CASEARIEÆ. Calyx free, 5- or 4-merous. Petals none. Stamens 6—30, inserted in a single row to the calyx-tube, usually alternating with as many staminodes.

GUIDONIA. Stamens 6—15, alternating with as many short staminodes. Flowers clustered or in corymbs.

Trib. II. HOMALIEÆ. Calyx free or adnate to the ovary, 4—15-merous. Petals as many. Stamens 4—15, or if more arranged in clusters, but always opposite the petals.

HOMALIUM. Petals as many as sepals. Ovary more or less adnate to the ovary and inferior.

Guidonia, Plum.

(*Casearia,* Jacq.)

Conspectus of Species.

* *Filaments very slender, many times longer than the anthers.*

† Stamens and staminodes 8 each, separately inserted.

All parts glabrous; leaves coarsely crenate; flowers about 2 lin. across; pedicels and calyx glabrous, ... *G. Canziala.*

Young shoots, calyx, and pedicels, and also often the nerves beneath of the serrulate leaves, puberulous; flowers only a line across, ... *G. glomerata.*

† † Stamens and staminodes 8 each, united at the base and forming a broad disk round the ovary.

All parts, also the flowers and pedicels, more or less tomentose or puberulous, .. *G. tomentosa.*

* * *Filaments only as long as the anthers.*

All parts more or less puberulous; stamens 8, ... *G. Vareca.*

1. G. CANZIALA (*Casearia Canziala,* Wall. ap. Voigt Hort. Calc. 78; *Casearia ovata,* Roxb. Fl. Ind. II. 428, non Willd.).

HAB. Frequent in the mixed forests, especially the lower ones, all over Pegu and Martaban.

Casearia Hamiltonii, Wall. Cat. differs in the crenate leaves, and in the number (10) of the stamens and staminodes.

2. G. GLOMERATA, (*Casearia glomerata,* Roxb. Fl. Ind. II. 419; DC. Prod. II. 49).

Var. α. GLABRIUSCULA, leaves almost glabrous.

Var. β. PUBERULA, leaves beneath on the nerves, the petioles &c., puberulous.

HAB. Var. β. Chittagong (Hf. and Th.).

3. G. VARECA, Baill. (*Casearia Vareca,* Roxb. Fl. Ind. II. 418; *C. Vareca,* Gærtn. Fr. I. t. 60).

HAB. Ava, Khakyen hills east of Bhamo (J. Anderson).—Fr. Apr.

Homalium, Jacq.

Conspectus of Species.

* *Stamens solitary and opposite to the petals. Flowers racemose or spiked, often collected into panicles.*

× Flowers about 2 lin. in diameter. Ovary villous.

Leaves coriaceous, tomentose or puberulous beneath; flowers tomentose, sessile; spikes robust, tomentose, ... *H. tomentosum.*

Leaves thin chartaceous, pubescent on the nerves; flowers tomentose, shortly pedicelled; racemes pubescent, slender, ... *H. Griffithianum.*

× × Flowers less than a line in diameter. Spikes collected into panicles.

All parts, also the spikes, quite glabrous; flowers sessile; ovary villous, .. *H. minutiflorum.*

* * *Stamens by 2 or more opposite to the petals.*

Quite like *H. Nepalense*, but stamens by threes; ovary tomentose; flowers longish pedicelled, in divaricate terminal glabrous panicles, ... *H. Schlichii.*

Glabrous; stamens by twos; ovary glabrous; racemes slender, glabrous, .. *H. fœtidum.*

1. H. TOMENTOSUM, Bth. in Linn. Proc. IV. 34. (*Blackwellia tomentosa*, Vent. Choix. t. 57; DC. Prod. II. 55; *Blackwellia spiralis*, Wall. in As. Research. XIII. 400 c. tab.; DC. Prodr. l. c.).

HAB. Frequent in the mixed forests all over Pegu, Arracan, and Martaban, up to 2000 ft. elevation.—Fl. Fr. Nov.—Jan.

2. H. GRIFFITHIANUM, Kurz in Journ. As. Soc. Beng. 1871. 57. (*Blackwelliæ* sp., Griff. Not. Dicot. 584. t. 585. A. f. 10; *Blackwellia dasyantha*, Turcz. in Bull. d. Nat. Mosc. 1863. 610).

HAB. Tenasserim, Mergui (Griff. 991).

This may possibly be *Astranthus Cochinchinensis*, Lour., Fl. Coch. 225 (= *Blackwellia*—Bl. Mus. Bot. II. 27).

3. H. MINUTIFLORUM, Kurz in Journ. As. Soc. Beng. 1827. 308.

HAB. Burma, probably Martaban or Tenasserim (Brandis).

Habit of *H. fœtidum*, but the flowers very minute.

4. H. SCHLICHII, Kurz, For. Fl. Burm. I. 532.

HAB. Forests of Chittagong (Dr. Schlich) Fl. CS.

5. H. FŒTIDUM, Bth. in Linn. Proc. IV. 37.—(*Blackwellia fœtida*, Wall.; Deless. Icon. III. 32. t. 53; *Ludia fœtida*, Roxb. Fl. Ind. II. 508).

HAB. Tenasserim, Mergui (Griff. *teste* Benth.).

TURNERACEÆ.

Turnera, L.

*1. T. ULMIFOLIA, L. sp. pl. 965 and Hort. Cliff. 122. t. 10.; DC. Prod. III. 346 (*T. angustifolia*, Curt. Bot. Mag. t. 281).

HAB. Disseminated from gardens and now often growing as wild in rubbishy places around the larger villages and towns, as Rangoon, Akyab, &c., Fl. Fr. CS.

PASSIFLOREÆ.

Conspectus of Genera.

Subord. I. PASSIFLOREÆ. Flowers hermaphrodite, or rarely unisexual and in this case the male and female corollas conform. Corona conspicuous, simple or double.

Tribe 1. *PASSIFLOREÆ.* Corona of the corolla simple or double and usually conspicuous. Petals usually herbaceous or coriaceous, rarely none.

Passiflora. Calyx-tube short. Petals 4—5, rarely none. Stamens 4—5. Styles 3. Leaves simple.

Subord. II. PAPAYACEÆ. Flowers hermaphrodite or unisexual. Stamens perigynous. Corona small or none.

Tribe 2. *MODECCEÆ.* Flowers hermaphrodite, or, if unisexual, the male and female corollas conform. Corona small or none. Petals usually included in the calyx-tube. Connective often produced beyond the anther-cells.

Modecca. Flowers unisexual. Calyx 5-cleft. Corona none or fringed. Disk-glands 5. Tendril-bearing herbs or shrubs.

Tribe 3. *PAPAYAEÆ.* Flower unisexual, the male and female corollas dissimilar, rarely polygamous. Corona none. Calyx minute. Male corolla tubular, the female one 5-petalled. Stamens in two rows, inserted to the corolla-tube. Erect trees, with milky juice.

Carica. Filaments free. Leaves simple, lobed or cut.

Passiflora, L.

Conspectus of Species.

Subg. 1. *Granadilla*, DC. Involucre 3-leaved, the leaflets entire or toothed, or dissected. Sepals and petals 5 each. Peduncles 1-flowered, arising together with the simple tendrils from the same leaf-axil.

* *Involucre-leaflets entire or toothed.*

Branches and branchlets wingedly 4-cornered; stipules and bracts entire; petiole with 4—6 glands; leaves entire, ... *P. quadrangularis.*

Branches &c., almost terete or slightly angular, never winged; stipules setaceous, long; bracts obovate, glandular-serrate at the tips; petiole 2-glanded at the apex; leaves entire, ... *P. laurifolia.*

* * *Involucre-leaflets pinnatifid-cut, the end-segments capillary or setaceous, glandular-thickened at the apex* (Dysosmia, DC.)

All parts hairy; leaves 3-lobed, the petiole gland-less, ... *P. foetida.*

Subg. 2. *Eu-Passiflora.* Flowers not involucred, the bracts remote, large, small or absent. Corona membranous, sharply folded, frilled at the edge.

* *Flowers bracted, the bracts small. Petals present.* (Decaloba, Endl.).

† Leaves lobed, velvety beneath.

Exactly as *P. Horsfieldii*, but leaves deeply 3-lobed and smaller, the lobes blunt, .. *P. caloneura.*

† † Leaves entire, glabrous.

Flowers small; petiole 1—2 in. long, 2-glanded at or about the middle; leaves glaucous beneath, acuminate, ...*P. Nepalensis.*

* * *Flowers apetalous, usually without bracts* (Cieca, Med.).

Flowers small; petiole $\frac{1}{4}$—$\frac{1}{2}$ in. long, 2-glanded at the apex; leaves acute, *P. suberosa.*

1. P. fœtida, Cav. Diss. 10. t. 289; DC. Prod. III. 331; Bot. Reg. t. 321; Bot. Mag. t. 2619.

Hab. Frequent in the more cultivated parts, especially in hedges, waste-places, and savannahs, of Chittagong and Ava to Arracan and Pegu.—Fl. Fr. Aug.—Jan.

N. B. *P. laurifolia*, L. (Bot. Reg. t. 13) and *P. quadrangularis*,

L. (Bot. Reg. t. 14 ; Bot. Mag. t. 2041) are frequently cultivated in gardens in Burma, and sometimes half-wild.

2. P. CALONEURA, Kurz MS.

HAB. Burma, probably Upper-Tenasserim or Martaban (Dr. Brandis).

The texture, nervature, and indument of the leaves are entirely those of *P. Horsfieldii.* Flowers and fruits unknown.

3. P. SUBEROSA, L. Amæn. Acad. I. 226 ; Mast. in Linn. Trans. XXVII. 630 (*P. Walkeriæ,* Wight Ill. t. 108.)

HAB. In hedges and in shrubbery of Chittagong.—Fl. Fr. RS.

Modecca, Lamk.

Conspectus of Species.

* *Petals inserted at the throat or to the tube of the calyx ; stigmas sessile* (Microblepharis, Wight).

Leaves entire ; seeds pitted, with crenate borders, ... *M. cordifolia.*

* * *Petals inserted on the bottom of the calyx. Style 3-cleft or styles 3, distinct.* (Blepharanthus, Wight).

Leaves 3- rarely 5-lobed ; seeds pitted, with a doubled-crenate border, ...*M. trilobata.*

1. M. CORDIFOLIA, Bl. Bydr. 939 ; Rumph. I. 169. t. 49 ; Miq. Fl. Ind. Bat. I. 702.

HAB. Not unfrequent in open places of the tropical forests, especially along the coasts, of the Andamans.—Fl. Fr. April, May.

2. M. TRILOBATA, Roxb. Corom. Pl. III. t. 271 and Fl. Ind. III. 132.

HAB. Frequent in the tropical and moister mixed forests, especially in open places, but also in village-bushes, in hedges, along river-sides, &c. all over Burma, from Chittagong and Ava southwards.—Fl. Begin. of RS. Fr. end of RS.

Carica, L.

*1. C. PAPAYA, L. sp. pl. 1466 ; Roxb. Fl. Ind. III. 824 ; WA. Prod. I. 352 ; Bot. Reg. t. 459 ; Bot. Mag. t. 2898 and 2899 ; Griff. Not. Dicot. 570. t. 584. f. 2 ; Wight Ill. II. t. 106, 107 ; Maingay in Journ. Agr. Hort. Soc. India 1867. 184 cum icon. (*Papaya vulgaris,* DC. Prod. XV/1. 414).

HAB. Generally cultivated all over Burma, especially the southern provinces where it often springs up half-spontaneously in uncultivated places and along river-banks.—Fl. Fr. nearly ∞.

CUCURBITACEÆ.

Conspectus of Genera.

Trib. I. CUCURBITEÆ, Endl. Anthers 2-celled, the cells straight, curved or flexuose. Ovary with 3 (rarely 2 or 5) placentas ; ovules horizontal, numerous.

* *Anther-cells flexuose or folded up (very rarely straight or only curved.)*

× Corolla rotate or bell-shaped, 5-petalled or 5-parted to the base. Filaments usually free.

+ Petals cirrhiferous or fringed.

HODGSONIA. Ovules 12, in pairs attached to each side of the 2 parietal placentas. Seeds large, united by pairs. Leaves lobed, coriaceous.

TRICHOSANTHES. Ovules and seeds very numerous, the later variously shaped, small or large. Petals fringed or rarely entire or nearly so, white. Leaves entire or lobed.

+ + Petals entire.

† Calyx-tube of males elongate. Stamens inserted in the calyx-tube, included, the anthers cohering into an oblong head.

GYMNOPETALUM. Stigmatic lobes of female flowers linear, simple. Tendril simple. Fruit small, pulpy within. Corolla yellow.

LAGENARIA. Stigmatic lobes of female flowers 2-lobed. Tendrils 2-cleft. Fruit with a woody rind. Petiole 2-glanded at the apex.

† † Male calyx-tube short (very rarely long). Stamens inserted at the mouth or in the tube of the calyx, usually exserted, the anthers free or slightly cohering.

O Stamens inserted at the mouth of the calyx; filaments exserted, recurved; anthers free, the cells bordering the broad connective.

LUFFA. Male flowers racemose. Fruit dry, with a woody-fibrose endocarp, dehiscing by an apical circumsciss opercle. Petiole without glands.

BENINCASA. Male and female flowers solitary. Fruit fleshy, berry-like, pulpy inside. Tendrils 2—3-cleft. Petiole without glands.

O O Stamens inserted below the mouth of the calyx; anthers conniving or cohering.

‡ Calyx furnished with 1—3 scales at the bottom.

MOMORDICA. Calyx with 2 or 3 scales. Male flowers usually furnished with a large complicate bract subtending the pedicel. Tendrils simple.

THLADIANTHA. Calyx with a single scale. Bracts of male flowers dimorphous, the inner ones smaller and imperfect.

‡ ‡ Calyx without scales.

CUCUMIS. Connective produced beyond the anther-cells. Tendrils simple.

CITRULLUS. Connective not prolonged. Stigmas reniform. Tendrils usually 2—3-cleft.

× × Corolla bell-shaped, 5-lobed to the middle or somewhat further down.

CEPHALANDRA. Male flowers solitary or nearly cymose. Stigmas narrow, 2-lobed or -parted. Tendrils simple.

CUCURBITA. Flowers solitary. Calyx-lobes spreading. Filaments free. Stigmas 3, 2-lobed or 2-forked. Tendrils usually 2- or more-cleft.

* * *Anther-cells straight or curved, not flexuose.*

×. Style inserted on a cupular or annular disk.

BRYONIA. Male flowers racemose or clustered. Filaments short, the connective not produced. Berry spherical, shortly peduncled.

MUCKIA. Male flowers solitary or clustered. Calyx bell-shaped. Connective produced beyond the anther-cells. Berry spherical, sessile. Seeds scrobiculate.

ZEHNERIA. Male flowers usually corymbose. Filaments elongate; anthers orbicular, the connective not produced, villous on the back. Berry shortly peduncled.

MELOTHRIA. Male flowers usually racemose. Anthers almost sessile, the connective produced beyond the anther-cells and usually 2-lobed. Berry usually long- and slender-peduncled.

× × Disk at the base of the style absent or obsolete.

RHYNCHOCARPA. Ovary with 1—3 placentas. Berry few-seeded, beaked. Connective produced beyond the anther-cells.

CTENOLEPIS. Calyx-tube short, the lobes subulate. Ovary with 2 or 3 placentas. Fruit oblique, few-seeded. Seeds concave-convex. Petiole furnished with a basilar pectinate leaflet. Connective not produced.

Trib. II. CREMOSPERMÆ. Anthers 1-celled. Ovary 1- or 3-celled; ovules 2 to many, suspended.

* *Seeds not winged.*

Subtrib. 1. *GYNOSTEMMEÆ.* Stamens 3 or 5, the filaments free or united. Ovary 3-celled, with 1 or 2 pendulous ovules in each cell.

GYNOSTEMMA. Petals lanceolate. Stamens 5, the filaments united. Berry globular. Leaves pedately 5-foliolate.

Subtrib. 2. *GOMPHOGYNEÆ.* Stamens 5; filaments free. Ovary 1-celled, with 2—6 ovules suspended from, or near, the summit of the cell.

ACTINOSTEMMA. Petals caudate-acuminate. Fruit almost globose, dehiscing by an apical opercle. Leaves hastate-cordate.

GOMPHOGYNE. Petals oblong, erose. Fruit turbinate, broadly 3-angular and 3-valved at the apex. Leaves pedately 5—7-foliolate.

* * *Seeds winged.*

Subtrib. 3. *ZANONIEÆ.* Stamens 5; filaments free; anthers oblong. Ovary 1-celled, with 3 thick parietal placentas; ovules numerous. Fruit dry, 1-celled, with a broad open 3-angular mouth at the top.

ALSOMITRA. Calyx-lobes 5. Stamens 4, perfect. Styles 3, the stigmas 2-lobed. Leaves 3-foliolate.

ZANONIA. Calyx-lobes 3. Styles 3, 2-cleft. Leaves simple.

Hodgsonia, Hf. and Th.

1. H. HETEROCLITA, Hf. and Th. in Linn. Proc. Nov. 1853; Hf. Ill. Him. Pl. t. 1—3; Fl. d. serr. t. 1262-63; (*Trichosanthes heteroclita*, Roxb. Fl. Ind. III. 705).

HAB. Not unfrequent in the tropical forests, especially along choungs, of the eastern slopes of the Pegu Yomah, and in Martaban, up to 2000 ft. elevation; also Chittagong.—Fl. Fr. March, April.

Trichosanthes, L.

Conspectus of Species.

Subg. 1. *Eu-Trichosanthes.* Petals conspicuously fringed. Male flowers racemose.

* *Male racemes without or with minute bracts, the bracts hardly a line long and inconspicuous. Seeds imbedded in a red or yellowish pulp, grooved or tubercled, with thickened crenate or waved margins.*

× Leaves more or less deeply palmately lobed.

+ Male racemes without bracts.

Fringes of the petals simple and straight; fruits ovate, acuminate; margin of seeds thickened and crenate, ... *T. cucumerina.*

+ + Male racemes minutely bracted.

Fringes of petals simple, curled; fruits elongate, spindle-shaped, ... *T. anguina.*

Fringes of petals jagged; fruits oblong, acuminate; seeds thick and irregularly tubercled, ... *T. lobata.*

× × Leaves cordate, not lobed.

Leaves pubescent; seeds with a central longitudinal ribbon, the lateral lobes truncate, .. *T. reniformis.*

* * *Male racemes conspicuously bracted, the bracts leafy, 3 lin. to 1½ in. long and longer. Seeds imbedded in a dirty dark-green pulp, smooth, with entire margins.* (Involucraria, Sering.)

Petals fringed with very long simple curled cilia; bracts of male flowers large and broad, 1—1½ in. long; calyx-lobes lanceolate, entire; leaves usually palmately and very deeply lobed; fruits large, oval-oblong, compressed, .. *T. grandibracteata.*

Fringes of petals very long and simple; bracts of male flowers usually smaller; calyx-lobes broadly ovate, serrate; leaves angular or palmately lobed; fruits globose, .. *T. bracteata.*

Petals to near their middle cut into numerous jagged segments, not fringed; female flowers not tubular; fruits globose; leaves cordate, usually not lobed, *T. cordata.*

As preceding but leaves larger and slightly angular, the tube of the female flowers 1½ in. long, ... *T. macrosiphon.*

Subg. 2. *Pseudo-Trichosanthes.* Flowers dioecious, of both sexes solitary in the leaf-axils, the female ones very shortly peduncled or almost sessile, the males on slender pedicels.

* *Petals with very long curled branched fringes.*

Leaves cordate, not lobed; fruits oblong; seeds almost globular, ... *T. dioica.*

* * *Corolla-lobes entire or only slightly lacerate.*

Leaves reniform; fruits globular or nearly so; seeds elliptically oblong, .. *T. integrifolia.*

*1. T. CUCUMERINA, L. sp. pl. 1432; DC. Prod. III. 315; Roxb. Fl. Ind. III. 702; Miq. Fl. Ind. Bat. I/1. 676; Naud. in Ann. d. sc. nat. 4 ser. XVIII. 191; Bth. Fl. Austr. III. 314.

HAB. Generally cultivated all over Burma, especially in the plains, and sometimes half wild along the larger rivers in cultivated lands, in hedges, around villages, &c.—Fl. Fr. Sept?—Jan.

2. T. LOBATA, Roxb. Fl. Ind. III. 703.

HAB. Here and there in hedges near Chittagong.—Fl. Fr. CS.

*3. T. ANGUINA, L. sp. pl. 1430; Bot. Mag. t. 722; DC. Prod. III. 314; Naud. in Ann. d. sc. nat. 4th ser. XVIII. 190; W.A. Prod. I. 350; Miq. Fl. Ind. Bat. I/1. 678; Bot. Mag. t. 722. (*Petola anguina*, Rumph. Herb. Amb. V. t. 148; *T. colubrina*, Jacq. Ecl. t. 128; DC. l. c.)

HAB. Burma, cultivated (according to Dr. Mason).

4. T. RENIFORMIS, Miq. Fl. Ind. Bat. I/1. 675; Kurz in Journ. As. Soc. Beng. 1871. 57.

HAB. Andamans, in open places of the forests on Rutland island.

5. T. BRACTEATA, Voigt Cat. Hort. Calc. 58. (*Modecca bracteata*, Lamk. Encyl. Meth. IV. 210; DC. Prod. III. 337; *T. palmata*, Roxb. Fl. Ind. III. 704; WA. Prod. I. 350; Wight Ill. II. t. 104, 105.)

HAB. Frequent in all mixed forests, amongst shrubbery and in bushes along rivers, in hedges, &c., also in the savannahs, all over Burma as far down as Tenasserim and the Andamans.—Fl. May—Octob.; Fr. April, May.

6. T. GRANDIBRACTEATA, Kurz MS.

HAB. Ava, along the Irrawaddi northwards from Mandalay; also Khakyen-hills east of Bhamo.—Fl. July.

7. T. CORDATA, Roxb. Fl. Ind. III. 703.

HAB. Not unfrequent in the savannahs and in the savannah-forests along the Sittang in Pegu.—Fl. May, June.

8. T. MACROSIPHON, Kurz in Journ. As. Soc. Beng. 1872. 308.

HAB. Upper Tenasserim, Attaran (Dr. Brandis).

9. T. INTEGRIFOLIA, (*Cucumis integrifolius*, Roxb. Fl. Ind. III. 724; *Gymnopetalum integrifolium*, Kurz in Journ. As. Soc. Beng. 1871. 58).

HAB. Frequent along the banks of rivers and choungs all over Pegu and Martaban; also Ava.—Fl. Febr.—April; Fr. May.

Gymnopetalum, Arn.

Conspectus of Species.

Subg. 1. *Eu-Gymnopetalum.* Diœcious. Male flowers in long-peduncled racemes, destitute of bracts. Fruits not ribbed. Flowers yellow.

Subg. 2. *Scotanthus*, Naud. Monœcious. Male flowers in bracted racemes. Fruit ribbed. Flowers white.

Leaves cordate, 3—5-angular; female flowers long-peduncled; fruits ovoid, .. *G. Cochinchinensis.*

Leaves palmately and deeply 3—5-lobed, the lobes blunt; fruits clavate-cylindrical, .. *G. heterophyllum.*

1. G. COCHINCHINENSE, Kurz in Journ. As. Soc. 1871. 57. (*Bryonia Cochinchinensis*, Lour. Flor. Coch. 595; DC. Prod. III. 305; *Momordica tubiflora*, Roxb. Fl. Ind. III. 711; *Scotanthus tubiflorus*, Naud. in Ann. d. sc. nat. 4 ser. XVI. 173. t. 3).

HAB. Not unfrequent in cultivated and rubbishy places in Chittagong and Arracan; Ava; Tenasserim.—Fl. Fr. Octob.

2. G. HETEROPHYLLUM, Kurz in Trim. Journ. Bot. 1875. 326.

HAB. Frequent in the tropical and moister upper mixed forests, especially on damp rocks and tree-stems along choungs, from Martaban down to Tenasserim and the Andamans.—Fl. Fr. Febr., March.

May possibly be an obtuse-lobed and smaller bracted form of *G. quinquelobum*, Miq. Fl. Ind. Bat. I/1. 681.

Lagenaria, Ser.

*1. L. VULGARIS, Ser. in DC. Prod. III. 299; WA. Prod. I. 341; Wight Ill. t. 105/bis f. 7; Miq. Fl. Ind. Bat. I/1. 669. (*Cucurbita Lagenaria*, L. sp. pl. 1434; Roxb. Fl. Ind. III. 718; Rheed. Hort. Malab. VIII. t. 1. 4. 5; Rumph. Herb. Amb. V. 393. t. 144; *L. idolatrica*, Ser. in DC. l. c.; Miq. l. c.).

Var. *α*. VULGARIS, all parts softly, but not viscidly, pubescent; fruits flask-shaped.

Var. *β*. IDOLATRICA, (*L. idolatrica*, Ser. l. c.), all parts viscid-pubescent; fruits pear-shaped.

HAB. Generally cultivated all over Burma, but more copiously in Ava and Prome.—Fl. March; Fr. CS.

Luffa, Cav.

Conspectus of Species.

* *Fruit smooth, at least not muricate or echinate.*

Fruit terete, or only with obscure darker coloured longitudinal streaks, .. *L. cylindrica.*

Fruit sharply 10-angular, ... *L. acutangula.*

* * *Fruit echinate or muricate.*

Flowers monœcious, yellow, the males and females from the same leaf-axil, very shortly pedicelled; fruit muricate, ... *L. graveolens.*

Flowers diœcious, white, the males in racemes, the females solitary; fruits densely echinate, the bristles spreadingly fibrillose or rarely ciliate, ... *L. echinata.*

1. L. CYLINDRICA, Ræm. Syn. Monog. Pep. II. 63; Naud. in Ann. d. sc. nat. 4 ser. XII. 119 cum. syn. numer. (*Momordica cylindrica*, L. sp. pl. 1433; *L. Petola*, and *L. Cattu-Picinna*, Ser. in DC. Prod. III. 303; *L. Aegyptiaca*, Mill. Dict.; DC. l. c.; Bth. Fl. Austr. III. 316; *L. pentandra*, Roxb. Fl. Ind. III. 712; WA. Prod. I. 343; Wight Icon. t. 499; *L. clavata*, Roxb. Fl. Ind. III. 714?).

Var. *α*. LEIOCARPA, Naud. l. c., flowers smaller; stamens 5; fruits elongate-oblong to clavate-cylindrical, 1—1½ ft. long; seeds pale-coloured or black.

Var. *β*. HEDERACEA, (*L. hederacea*, Wall. MS.), leaves usually smaller, more scabrous; stamens 3; fruits oblong to elliptical, 2—4 in. long, rarely longer; seeds black.

HAB. Var. *β*. common in all leaf-shedding forests, in the savannahs, in hedges, rubbishy places, village-bushes, &c., all over Burma down to Tenasserim and the Andamans; var. *β*. much scarcer.—Fl. Close of RS.; Fr. CS.

The varieties of this species require further investigation.

*2. L. ACUTANGULA, Roxb. Fl. Ind. III. 713; DC. Prod. III. 302; Naud. in Ann. d. sc. nat. 4 ser. XII. 122; Miq. Fl. Ind. Bat. I/1. 668. (*L. fœtida*, Cav. Icon. I. 7. t. 9—10; DC. l. c.; Bot. Mag. t. 1638; *Cucumis acutangulus*, L. sp. pl. 1436; *Petola Bengalensis*, Rumph. Amb. V. t. 149; Rheed. Hort. Malab. VIII. t. 7).

HAB. Cultivated by natives in Chittagong.

Luffa amara, Roxb., with oblong fruits only 3—4 inches long and tapering at both ends, is probably only a variety of the above.

3. L. GRAVEOLENS, Roxb. Fl. Ind. III. 716; Naud. in Ann. d. sc. nat. 4 ser. XII. 124.

HAB. In rubbishy places in a village near Chittagong.—Fl. Fr. Octob.

4. L. ECHINATA, Roxb. Fl. Ind. III. 715; Walp. Rep. II. 200; WA. Prod. I. 343; Naud. in Ann. d. sc. nat. 4 ser. XII. 128. (*L. Bindaal*, Roxb. Fl. Ind. III. 717; Edg. in Linn. Proc. IX. 322 (*L. Bandaal*).

HAB. Arracan, in hedges and rubbishy places in the Kolodyne valley. —Fl. Fr. Octob.

Dr. Hooker (in Fl. trop. Afr. II. 531) states that the flowers in Indian specimens of this species are always yellow, not white as Roxburgh describes and figures them. The species is common enough in the plains of Northern Bengal but never have I seen the flowers of it other than white.

Benincasa, Savi.

*1. B. CERIFERA, Savi Mem. sopra Piant. Cucurb. I. 1818. 6. cum icon.; DC. Prod III. 303; Naud. in Ann. d. sc. nat. 4 ser. XII. 87; Miq. Fl. Ind. Bat. I/1. 665. Jacq. Ecl. pl. t. 153-54. (*Cucurbita Pepo*, Lour. Coch. 593; Roxb. Fl. Ind. III. 718; Rumph. Herb. Amb. V. t. 143; Rheed. Hort. Malab. VIII. t. 3).

HAB. Generally cultivated by the natives.—Fl. RS.; Fr. CS.

Momordica, L.

Conspectus of Species.

* *Monœcious. Bracts only 2—3 lin. long, at about the middle of the filiform peduncle.*

Leaves palmately 5-lobed; calyx-lobes oblong, acute; bracts entire; at the apex of the peduncle; fruit few-seeded, small, ... *M. Charantia.*

As preceding, but bracts minutely toothed, below or near the middle of the peduncle; fruit larger, many-seeded, ... *M. balsamina.*

* * *Diœcious. Bract of the male (and sometimes of the female) flowers just below the flower and embracing the calyx, $\frac{1}{3}$—1 in. long or longer.*

Leaves 3- to 5-lobed; calyx-lobes linear, acuminate; seeds about 3 lin. long, *M. dioica.*

Leaves cordate, not lobed or only angular; bracts pubescent or velvety; calyx-lobes oblong, blunt; seeds about 3 lin. long, ... *M. subangulata.*

Leaves 3- rarely 5-lobed, with the lobes acuminate; bracts often hirsute; calyx-lobes oblong, acuminate; seeds about an inch long, ... *M. Cochinchinensis.*

*1. M. Charantia, L. sp. pl. 1433; Roxb. Fl. Ind. III. 707; DC. Prod. III. 311; Bot. Mag. t. 2455; Fl. d. serr. t. 1047; WA. Prod. I. 348; Wight Icon. t. 504; Naud. in Ann. d. sc. nat. 4 ser. XII. 131; Miq. Fl. Ind. Bat. I/1. 663. (*M. muricata*, Willd. sp. pl. IV. 602; Roxb. Fl. Ind. III. 707; WA. Prod. I. 348; Miq. l. c.; *M. Senegalensis*, Lamk. Encycl. IV. 239; DC. l. c.; *Cucumis Africanus*, Ldl. Bot. Reg. XII. t. 980; *Amara Indica*, Rump. Herb. Amb. V. t. 151; Rheed. Hort. Malab. VIII. t. 9—19.).

Hab. Generally cultivated all over Burma, and frequently seen like wild in deserted toungyas and gardens, in rubbishy places around villages, &c.—Fl. Fr. C. and HS.

2. M. dioica, Roxb. Fl. Ind. III. 709; DC. Prod. III. 312; WA. Prod. I. 349; Wight Icon. t. 505—506; Dcne. in Jacq. Voy. IV. 60. t. 71.; Naud. in Ann. d. sc. nat. 4 ser. XII. 133.

Hab. Burma (according to Rev. Dr. Mason).

3. M. subangulata, Bl. Bydr. 928; Miq. Fl. Ind. Bat. I/1. 664.

Hab. Chittagong (H. Bruce); Pegu and Prome (Wall. Cat. 6743). —Fl. Sept.

4. M. Cochinchinensis, Spreng. Syst. Veg. III. 14. (*Muricia Cochinchinensis*, Lour. Fl. Coch. II. 732; DC. Prod. III. 318; *M. mixta*, Roxb. Fl. Ind. III. 709; WA. Prod. III. 349; Bot. Mag. t. 5145; Fl. d. serr. XIV. t. 1478; Naud. in Ann. d. sc. nat. 4 ser. XII. 132; Miq. Fl. Ind. Bat. I/1. 664; *Zucca Commersiana*, Ser. in DC. l. c. 319).

Hab. Not unfrequent in the tropical forests, especially along choungs, of the eastern and southern slopes of the Pegu Yomah, and from Martaban to Tenasserim.—Fl. Jan.—March.

Thladiantha, Bunge.

1. T. dubia, Bung. Enum. Pl. Chin. Bor. 29; Walp. Rep. V. 763; Naud. in Ann. d. sc. nat. 4 ser. XII. 150; Bot. Mag. t. 5469. (*Gymnopetalum Horsfieldii*, Miq. Fl. Ind. Bat. I/1. 680.)

Hab. Frequent along banks of choungs, especially along the borders of hill-toungyas and savannahs, of the Pegu Yomah.—Fl. March, April.

Cucumis, L.

Conspectus of Species.

× Flowers on slender pedicels, several together in the axils of the leaves.

Ovary muricate, spindle-shaped; male flowers by 3—6, females solitary, ... *C. sativus.*

Ovary densely villous or pubescent, usually oblong or elliptical; male and female flowers usually mixed, ... *C. Melo.*

× × Flowers all singly from the leaf-axils, on stiff, rather short peduncles.

Flowers inconspicuous, ... *C. trigonus.*

*1. C. SATIVUS, L. sp. pl. 1437; DC. Prod. III. 300; Naud. in Ann. d. sc. nat. 4 ser. XI. 27; Roxb. Fl. Ind. III. 720.—(*C. Momordica*, Roxb. l. c.; *C. sativus var. Sikkimensis*, Hf. Bot. Mag. t. 6206?)

HAB. Much cultivated, especially in the plains.—Fl. Jan.

2. C. MELO, L. sp. pl 1436; DC. Prod. III. 300; WA. Prod. I. 341; Roxb. Fl. Ind. III. 720; Naud. in Ann. d. sc. nat. 4 ser. XI. 34. c. syn. plurimis. (*C. deliciosus*, Roth; *C. Conomon*, Thbg.; *C. flexuosus*, L.; *C. Chate*, L. and *C. Dudaim*, L. Andr. Repos. VIII. t. 548, ap. Sering. in DC. Prod. l. c.; *C. utilissimus*, Roxb. Fl. Ind. III. 321; WA. Prod. I. 342; *C. cicatrisatus*, Stocks in Hook. Kew Gard. Misc. IV. 148; Walp. Ann. IV. 864).

Var. α. PUBESCENS (*C. pubescens*, Willd. sp. pl. IV. 614; Wight Icon. t. 496; WA. Prod. I. 342; Roxb. Fl. Ind. III. 723; DC. Prod. III. 301; Royle Ill. Him. Pl. I. 220. t. 47. f. 1; *C. Melo agrestis*, Naud. in Ann. d. sc. nat. 4 ser. XI. 73; C. *trigonus*, Bth. Fl. Austr. III. 317, vix. Roxb.; *C. Maderaspatanus*, Roxb. Fl. Ind. III. 723, non L.; *C. turbinatus*, Roxb. l. c. ?, lobis calycinis subulatis et tubo supra ovario valde constricto insignis), all parts much smaller; fruits only as large as a plum, from oblong to turbinate, not edible; flowers smaller and shorter pedicelled, usually only by 2—3 in the leaf-axils.—Considered by Naudin to be the wild stock of the cultivated melons.

Var. β. CULTA (cf. syn. sub specie citat. et var. numerosissimæ ap. Naud. l. c.), all parts more robust; fruits larger and often very large, variously shaped; flowers nearly an inch across, on long filiform pedicels, usually by 3—5 from the leaf-axils.

HAB. Var. α. not unfrequent along banks of rivers, in uncultivated and rubbishy places, etc., all over Ava, Chittagong and Pegu; var. β. generally cultivated in several varieties.—Fl. H. & R. S; Fr. DS.

Citrullus, Schrad.

*1. C. VULGARIS, Schrad. in Linnæa XII. 412; Naud. in Ann. d. sc. nat. 4. ser. XII. 100 cum syn. numerosis. (*Cucurbita Citrullus*, L. sp. pl. 1435; Roxb. Fl. Ind. III. 719; WA. Prod. I. 351; *Cucumis Citrullus*, Ser. in DC. Prod. III. 301; *C. fistulosus*, Stocks in Hook. Journ. Kew. Gard. Misc. III. 74. t. 3; Walp. Ann. IV. 863; *Anguria Indica*, Rumph. Herb. Amb. V. t. 146).

HAB. Much cultivated all over the country.—Fl. Jan., Febr.; Fr. HS.

Cephalandra, Schrad.

1. C. GRANDIS (*Bryonia grandis*, L. Mant. 126; DC. Prod. III. 305; *Momordica monadelpha*, Roxb. Fl. Ind. III. 708; *Coccinia Indica*, WA. Prod. I. 347; Wight Ill. II. t. 105; Dcne. in Jacq. Voy. IV. 60. t. 72; Hook. Icon. t. 138).

Hab. Frequent in hedges, village-bushes, along river-banks and in rubbishy places, all over Ava, Chittagong, Arracan, and Pegu.—Fl. Sept., Aug.

Cucurbita, L.

Conspectus of Species.

× Calyx-lobes subulate.

Leaves not deeply lobed; petiole scarcely prickly, ... *C. maxima.*

Leaves deeply lobed; petiole prickly, ... *C. Pepo.*

× × Calyx-lobes leafy.

Leaves more or less lobed; petiole scarcely prickly, ... *C. moschata.*

*1. C. moschata, Duch. Dict. d. sc. nat. XI. 234; DC. Prod. III. 317; Naud. in Ann. d. sc. nat. 4 ser. VI. 47. (*C. maxima,* WA. Prod. I. 351; Wight Icon. t. 507, non Duch.; Rheed. Hort. Malab. VIII. t. 2).

Hab. Cultivated in Chittagong, Pegu, and probably elsewhere.—Fl. Fr. April, May.

Bryonia, L.

1. B. laciniosa, L. Mant. 498; Roxb. Fl. Ind. III. 728; DC. Prod. III. 308; WA. Prod. I. 345; Wight Icon. t. 500; Planch. Fl. d. serr. 2 ser. II. 39. t. 1202; Naud. in Ann. d. sc. nat. 4 ser. XII. 139.

Hab. Not uncommon in hedges and in rubbishy places near villages of Prome and Chittagong.—Fl. Octob.; Fr. March.

Muckia, Arn.

1. M. Maderaspatana, Kurz in Journ. As. Soc. Beng. 1871, 58. (*Cucumis maderaspatanus,* L. sp. pl. 1438, non Roxb.; *M. scabrella,* Arn. in Hook. Journ. Bot. III. 276; Wight Ill. II. t. 105*; Walp. Rep. II. 199; Naud. in Ann. d. sc. nat. 4 ser. XII. 142; *Bryonia scabrella,* L. f. Suppl. 424; Roxb. Fl. Ind. III. 724; Wight Icon. t. 501).

Var. α. scabrella, leaves broadly triangular to ovate in outline, deeply sinuate-cordate at the base, 3—5-lobed or -angular, the lobes acute or blunt; berries often 4—6 lin. thick.

Var. β. gracilis, (*Bryonia gracilis,* Wall. Cat. 6714), leaves not lobed nor angular, ovate-lanceolate, acuminate, almost hastate-cordate at the base; berries usually only 3—4 lin. thick.

Hab. Both varieties frequent in hedges, bushes, &c., in deserted toungyas, along river-banks, &c., all over Burma; var. β. more especially in the savannahs of the plains.—Fl. Fr. CS.

Zehneria, Endl.

Conspectus of Species.

Subg. 1. *Karivia,* Arn. Berry large, nearly 2 in. long; seeds numerous, almost globular.

Leaves polymorphic, almost chartaceous, glabrous, ... *Z. umbellata.*

Subg. 2. *Zehneria*, Endl. Berry small, globose. Seeds few, compressed-oblong. Leaves herbaceous, flaccid, cordate, repand-toothed, ... *Z. Hookeriana.*

1. Z. UMBELLATA, Thw. in Ceyl. Pl. 125. (*Bryonia umbellata*, Klein in Willd. sp. pl. III. 618; WA. Prod. I. 345; *Momordica umbellata*, Roxb. Fl. Ind. III. 710; *Karivia umbellata*, Arn. in Hook. Journ. Bot. III. 275; Miq. Fl. Ind. Bat. I/1. 661).

HAB. Common, not only in cultivated lands, in bushes, hedges, &c., in and around villages, but still more so in the mixed forests and savannahs, all over Burma, up to 3000 ft. elevation.—Fl. H. and RS.; Fr. CS.

2. Z. HOOKERIANA, WA. in Hook. Journ. Bot. III. (*Bryonia Hookeriana*, WA. Prod. I. 345; Wight Ill. t. 105).

HAB. Ava, Khakyen hills.—Fr. May.

Melothria, L.

1. M. INDICA, Lour. Fl. Coch. I. 43; DC. Prod. III. 313; Naud. in Ann. d. sc. nat. 4 ser. XVI. 169. t. 2. (*Bryonia tenella*, Roxb. Fl. Ind. III. 725; *Aechmandra Indica*, Arn. in Hook. Journ. of Bot. III. 274; *Cucumis murinus viridis*, Rumph. Herb. Amb. V. t. 171. f. 2?).

HAB. In hedges near Chittagong.—Fl. Fr. Octob.

Rhynchocarpa, Schrad.

Conspectus of Species.

All parts more or less pubescent; leaves cordate with rounded basal lobes; berry striate, hairy, ... *R. rostrata.*

Leaves deltoid with spreading acute basal lobes, rough above; berries smooth and glabrous, ... *R. deltoidea.*

1. R. ROSTRATA, (*Bryonia rostrata*, Rottl. Nov. Act. Berol. IV. 212; DC. Prod. III. 304; WA. Prod. I. 346; *Bryonia pilosa*, Roxb. Fl. Ind. III. 726).

HAB. Ava, Irawaddi valley near Pagha myo (Wall. Cat. 6713).—Fl. Sept.

2. R.? DELTOIDEA, Kurz MS.

HAB. Upper Tenasserim, in Attaran (Dr. Brandis); Pegu and Prome Irrawaddi valley.—Fl. Fr. Sept., Octob.

Gomphogyne, Griff.

Conspectus of Species.

Capsule club-shaped, rather narrow; seeds usually 4, about a line long, rounded, obscurely tubercled-wrinkled, ... *G. heterosperma.*

Capsule broadly turbinate: seeds usually 2, about 3 lin. long, oblong-4-angular, rough with tubercled margins, ... *G. cissoides.*

1. G. HETEROSPERMA, Kurz in Journ. As. Soc. Beng. 1871. 58. (*Zanonia heterosperma*, Wall. Cat.; Miq. Fl. Ind. Bat. I/1. 683; *Alsomitra heterosperma*, Rœm. Syn. Monog. II. 118).

HAB. Ava, on Taong dong (Wall.).—Fr. Nov.

A simple-leaved species of *Actinostemma*, or more probably *Gomphostemma*, is not unfreqnent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah, especially at the head-waters of the Swa-choung, but I did not succeed in finding either flower or fruit of it.

Alsomitra, Rœm.

1. A. SARCOPHYLLA, Bth. and Hf. Gen. Plant. I. 840; Bot. Mag. t. 6017. (*Zanonia sarcophylla*, Wall. Pl. As. rar. II. 28. t. 133).

HAB. Not unfrequent in waste places, light jungle, on limestone rocks, &c., of Ava from Mandalay as far south as Prome.—Fl. Sept.; Fr. Octob.

BEGONIACEÆ.

Begonia, L.

Conspectus of Species.

Subg. 1. *Casparea*, DC. Capsule fleshy and berry-like, dehiscing on the angles or broad thick wings.

A robust rather glabrous branched herb; styles 4; berry 4-celled and 4-cornered, the angles produced into as many horn-like appendages, ... *B. Roxburghii.*

Subg. 2. *Begonia*, DC. Capsules dry, dehiscing in a semi-circular line along their sides near the wings or angles.

* *Styles 2, each branch 2-cleft or variously dilated or branched; capsule 2-celled. Placentas 2-parted, i. e. consisting of 2 longitudinal ovule- or seed-bearing blades.*

× Stamens free. Capsule unequally 3-winged, the 2 lateral wings often reduced to a membranous rib.

A robust branched herb, softly paleaceous-pilose; leaves long-petioled, lobed, .. *B. laciniata.*

As preceding but more slender and quite glabrous,...................... *B. megaptera.*

Robust rather simple herb, softly palaceous-pilose; leaves long-petioled, not lobed; petals pale rose-coloured, only about ⅓ in. long; capsules stuppose-hirsute, the lower wing broad and rounded, ⅔ in. long,..................... *B. nemophila.*

As preceding but more glabrous; flowers larger; capsules glaucous-green, glabrous, .. *B. barbata.*

× × Stamens monadelphous.

+ Male perianth 5-lobed, the female one 5—6-lobed. Capsule unequally 3-winged.

† Inflorescence axillary or arising from the base of the leaf, or prolific from an axillary bud.

‡ Not prolific. Leaves alternate or whorled, rarely reduced to a single one. Flowers small, white.

O Glabrous.

Leaves alternate, the petioles 1—2 lin. long, ...*B. procridifolia.*

Leaves whorled, longer petioled, ...*B. verticillata.*

O O Stems and petioles pubescent.

Inflorescence glabrous; leaves alternate, long-petioled, sparingly and minutely hirsute above, ... *B. Martabanica.*

‡ ‡ Prolific, with a solitary radical or a few alternate leaves. Flowers small, white.

More or less stellate-velvety; inflorescence glabrous; leaves alternate or rarely solitary, .. *B. sinuata.*

Glabrous; leaf solitary, from the base of which 2 or more flowering peduncles arise, .. *B. prolifera.*

Stems etc. and the conspicuously bracted inflorescence paleaceous-pilose, the indumentum often intermixed with soft gland-hairs, ... *B. paleacea.*

† † Leaves and inflorescence radical.

Leaves contracted into a petiole 2—3 lin. long, ciliate, hispid above; flowers nearly an in. in diameter, white, ... *B. nivea.*

+ + Perianth of both sexes 2-sepalled, apetalous.

Very tender herb; leaves alternate, minutely and sparingly pilose above; flowers small, ... *B. flaccidissima.*

* * *Styles* 3, *free or connate. Capsule* 3-*celled and* 3-*winged.*

× Placentas entire and simple.

Glabrous, the inflorescence radical or nearly so; leaves radical, deeply lobed; perianth 2-sepalled, apetalous, ... *B. Brandisiana.*

× × Placentas 2-cleft.

+ Caulescent herbs, with alternate cauline leaves.

All parts (also the inflorescence) glabrous; capsule 3 lin. long, the wings truncate at the apex; stamens monadelphous, ... *B. parvuliflora.*

Leaves sparingly and minutely bristly and glossy above, in other respects very similar to the preceding; capsule ½ in. long; stamens free, the anthers mucronulate; styles free, ... *B. modestiflora.*

Like preceding, but leaves opaque and more pilose; stamens monadelphous, the anthers terminated by the broad truncate connective; styles united up to the middle, .. *B. scutata.*

Leaves minutely and sparingly pilose; inflorescence glandular-puberulous; stamens monadelphous; capsule-wings half-sagittate, produced into blunt basal lobes, .. *B. surculigera.*

+ + Scapigerous herbs, the leaves and inflorescences radical and usually solitary.

Leaves very long-petioled, peltate at the base, papillose-dotted and glabrous, .. *B. subperfoliata.*

Leaves very long-petioled, cordate (not peltate), papillose and minutely pilose above; stamens free, ... *B. velutina.*

1. B. Roxburghii, DC. Prod. XV/1. 398 (*Casparya oligocarpa*, DC. l. c. 276; *B. Malabarica*, Roxb. Fl. Ind. III. 648; Casparea polycarpa, DC. Prod. l. c. 277).

Hab. Chittagong.

2. B. laciniata, Roxb. Fl. Ind. III. 649; Bot. Mag. t. 5021; DC. Prod. XV/1. 347.

Hab. Along rivulets of the damp hill-forests of the Martaban hills east of Tounghoo, at 6—7000 ft. elevation. Fr. March.

3. B. MEGAPTERA, A. DC. in Ann. d. sc. nat. 4 ser. XI. 134 ; and Prod. XV/1. 348.

HAB. Martaban hills (Nattoung) east of Tounghoo (Revd. Mason).

4. B. NEMOPHILA, Kurz MS.

HAB. Not unfrequent in the damp hill-forests, especially along rocky streamlets, of the Martaban hills east of Tounghoo, at 3000 to 4000 ft. elevation.—Fl. Fr. March.

5. B. PROCRIDIFOLIA, Wall. Cat. 6292 ; DC. Prod. XV/1. 352.

HAB. Tenasserim, Tavoy (Wall.).—Fl. Fr. Aug.

6. B. VERTICILLATA, Hook. Icon. Pl. t. 811 ; DC Prod. XV/1. 353.

HAB. Tenasserim, Moulmein hills (Lobb, Parish).

7. B. MARTABANICA, A. DC. in Ann. d. sc. nat. 4 ser. XI. 136 and Prod. XV/1. 354.

HAB. Tenasserim (Lobb, Helfer).

8. B. SINUATA, Wall. Cat. 3680 ; Meisn. in Linn. 1838. Litt. 15. de prolif. ; DC. Prod. XV/1. 354. (*Diploclinium biloculare*, Wight Icon. t. 1840 ; *B. Andamanensis*, Parish MS. in Kurz And. Rep. p. 15).

HAB. Tenasserim frequent from Moulmein down to Mergui ; also on the Andamans.—Fl. Fr. June, July.

9. B. PROLIFERA, A. DC. in Ann. d. sc. nat. 4 ser. XI. 135 and Prod. XV/1. 353.

HAB. Tenasserim, Moulmein (Parish, Lobb).

10. B. PALEACEA, Kurz in Journ. As. Soc. Beng. 1871. 60.

HAB. Upper Tenasserim, by the sides of hill-streams.—Fl. Fr. June—Aug.

11. B. NIVEA, Parish in Journ. As. Soc. Beng. 1873. 81.

HAB. Tenasserim, Moulmein (Parish).

12. B. FLACCIDISSIMA, Kurz in Journ. As. Soc. Beng. 1872. 308.

HAB. Martaban, on Zwakabin, a lime-stone hill north of Moulmein. (Parish).—Fl. Octob.

13. B. BRANDISIANA, Kurz in Journ. As. Soc. Beng. 1871. 58.

HAB. Tenasserim, Attaran (Dr. Brandis).

14. B. PARVULIFLORA, A. DC. Ann. d. sc. nat. 4 ser. XI. 136 and Prod. XV/1. 355.

HAB. Upper Tenasserim (Lobb).

15. B. MODESTIFLORA, Kurz in Jonrn. As. Soc. Beng. 1871. 59.

HAB. On sandstone-rocks in the bed of hill-streams on Baronga island opposite Akyab, Arracan, up to 1000 ft. elevation.—Fl. Sept., Oct.

16. B. SCUTATA, Wall. Cat. 3686 ; DC. Prod. XV/1. 328. (*B. dioica*, Don. Prod. Nep. 223 ?).

HAB. Ava, near Bhamo, and most probably elsewhere.—Fl. Fr. Sept.

17. B. SURCULIGERA, Kurz in Journ. As. Soc. Beng. 1871. 59.

HAB. Arracan, frequent on moist mossy sandstone-rocks in the tropical forests of the Akyab district.—Fl. Fr. Octob.

18. B. SUBPERFOLIATA, Parish in Journ. As. Soc. Beng. 1873. 81.

HAB. Tenasserim, Moulmein District. (Revd. Parish).

19. B. VELUTINA, Parish in Journ. As. Soc. Beng. 1873. 81.

HAB. Tenasserim, Moulmein District (Parish, Stoliczka).

Habit of *B. subpeltata*, Wight, but differs in the 2-lamellate placentas.

DATISCACEÆ.

Tetrameles, R. Br.

1. T. NUDIFLORA, R. Br. in Horsf. Pl. Jav. rar. 79. t. 17; DC. Prod. XV/1. 411; Bedd. Fl. Sylv. t. 212. (*T. Grahamiana*, Wight Icon. t. 1956).

Var. *α*. GENUINA, leaves more or less pubescent beneath.

Var. *β*. GLABRA, leaves glabrous.

HAB. Frequent in the tropical forests and along choungs in the upper mixed forests, all over Pegu and Martaban down to Tenasserim and the Andamans; var. *β*. on the Andamans.—Fl. HS. Fr. Begin of RS.

The open ovary, the parietal placentation, and the habit generally (especially of *Datisca*) point to *Resedaceæ*.

CACTEÆ.

Opuntia, Mill.

*1. O. DILLENII, Haw. in DC. Prod. III. 472; WA. Prod. I. 363; Wight Ill. II. t. 114. (*Cactus Dillenii*, Bot. Reg. t. 255; *Cactus Indicus*, Roxb. Fl. Ind. II. 475).

HAB. Cultivated in the drier districts of Burma, as in Prome.

FICOIDEÆ.

Conspectus of Species.

Trib. I. AIZOIDEÆ. Calyx free but with a distinct turbinate tube bearing the stamens at or below the summit. Fruit a capsule. (*Capsule circumsciss. Leaves opposite.*)

SESUVIUM. Stamens 5 to many. Ovary 3—5-celled, with axillary many-ovuled placentas.

TRIANTHEMA. Stamens 5 or 10, or many. Ovary 1—2-celled, with basilar 1-more-ovuled placentas.

Trib. II. MOLLUGINEÆ. Calyx free, divided to the base or nearly so. Petals 3—5, or none. Stamens hypogynous or almost perigynous. Fruit a capsule or divided into 2—3 cocci.

* *Fruit a capsule. Leaves usually with stipules.*

MOLLUGO. Petals 3—5, or none. Ovary 3—5-celled, with many ovules in each cell. Leaves usually spuriously whorled.

* * *Fruit 2—3-coccous, the cocci 1-seeded. Leaves without stipules.*

GISEKIA. Petals none. Carpels 3—5, free. Utricules 5—3. Leaves opposite or spuriously whorled.

Sesuvium, L.

1. S. PORTULACASTRUM, L. sp. pl. 446; DC. Prod. III. 453; Roxb. Fl. Ind. II. 509.

HAB. Not unfrequent on mud banks of tidal channels and in the tidal jungles of lower Pegu and Tenasserim; also on the Andamans.—Fl. May—June.

Trianthema, L.

Conspectus of Species.

* *Ovary and capsule* 2-*celled; styles* 2.

Flowers clustered; stamens 10 or 11; ovary 4-ovuled, ... *T. decandra.*

Flowers clustered; stamens 5; ovary 4-ovuled, ... *T. pentandra.*

* * *Ovary and capsule* 1-*celled; style* 1.

Leaves obovate, rather large, glabrous or slightly pubescent; flowers solitary; ovary many-ovuled; stamens about 15; style long, ... *T. obcordata.*

Leaves linear, small, covered with crystalline dots; stamens 5; style short, simple, .. *T. crystallina.*

1. T. DECANDRA, L. Mant. 70; Roxb. Fl. Ind. II. 444; WA. Prod. I. 355; Wight Icon. t. 296.

HAB. Ava, on the banks of the Irrawaddi.—Fl. Fr. Jan.

2. T. OBCORDATA, Roxb. Fl. Ind. II. 445; WA. Prod. I. 355; Wight Icon. t. 288.

HAB. Arracan, in rubbishy places near Akyab.

Requires comparison with *Trianthema monogyna*, L.

3. T. CRYSTALLINA, Vhl. Symb. I. 32; Roxb. Fl. Ind. II. 444; WA. Prod. I. 355; Edg. in Linn. Journ. VI. 203.

HAB. Ava, on sand-banks of the Irrawaddi, as near Yenangchoung (Wall.).—Fl. Sept.

Mollugo, L.

Conspectus of Species.

Subg. 1. *Glinus*, L. Seed with a strophiole dilated into a small arillus.

Softly pubescent or tomentose; flowers rather large, in axillary clusters; stamens about 10—15, ... *M. Glinus.*

Glabrous or slightly pubescent; flowers rather small, on long slender pedicels, forming axillary clusters; stamens fewer than 10, ... *M. Spergula.*

Subg. 2. *Mollugo*, L. Seeds without a strophiole.

Glabrous, the stems angular; flowers minute, on capillary pedicels, forming cymes, .. *M. stricta.*

1. M. GLINUS, A. Rich. Fl. Abyss. I. 48. (*Glinus lotoides*, L. sp. pl. 663; DC. Prod. III. 455; WA. Prod. I. 362; Fenzl Monogr. Mollug. 357;

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Sibth. Fl. Graec. t. 472; *Tryphera prostrata*, Bl. Bydr. 549; DC. Prod. XIII/2. 424).

Var. α. LOTOIDES, (*Glinus lotoides*, L. l. c.; *M. Glinus* α. *candida*, Fenzl. Monogr. Monog. Mollug. 358), branches often white-tomentose; flowers sessile or nearly so.

Var. β. DICTAMNOIDES, (*Glinus dictamnoides*, L. Mant. 243; DC. Prod. III. 455; WA. Prod. I. 362; *Pharnaceum pentagynum*, Roxb. Fl. Ind. II. 103), leaves pubescent but greenish; flowers usually pedicelled.

HAB. Var. α. common in fallow-fields, along river-banks, in rubbishy places, etc. all over Pegu, especially in the cultivated plains; also Ava.—Fl. May, June.

2. M. SPERGULA, L. sp. pl. 131; DC. Prod. I. 391; WA. Prod. I. 44. (*M. stricta*, Roxb. Fl. Ind. I. 360; *M. parviflora*, Ser. ap. DC. Prod. I. 391; *Glinus Mollugo*, Fenzl Monog. *Mollug.* 359; *Alsine erecta* Burm. Zeyl. 13. t. 7; *Pharnaceum Mollugo*, L., Roxb. Fl. Ind. II. 102).

HAB. Frequent in fallow-fields, along road-sides and river-banks, in rubbishy places, etc. all over Burma, especially the cultivated plains, ascending up to 4500 ft. elevation into the hill-toungyas of Martaban.—Fl. HS.

3. M. STRICTA, L. sp. pl. 131; DC. Prod. I. 391; Fenzl Monogr. Mollug. 380; Walp. Rep. II. 241; WA. Prod. I. 44.

Var. α. STRICTA (*M. stricta*, L. l. c.), leaves rather thin and green, linear-lanceolate, usually acuminate at both ends.

Var. β. PENTAPHYLLA, Bth. Fl. Hongk. 23. (*M, pentaphylla*, L. sp. pl. 131; DC. Prod. I. 391; Roxb. Fl. Ind. I. 359; WA. Prod. I. 44; Fenzl Monogr. Mollug. 381; *M. triphylla*, Lour. Fl. Cochinch. 79; DC. Prod. I. 392; Roxb. Fl. Ind. I. 360; WA. Prod. I. 44).

HAB. Var. β. not uncommon in toungyas and native gardens of Martaban and Pegu, and most probably elsewhere.—Fr. May.

Gisekia, L.

1. G. PHARNACEOIDES, L. Mant. 2. app. 562; Roxb. Corom. Pl. II. t. 183; DC. Prod. XIII/2. 27; Wight Icon. t. 1167.

HAB. Ava, near Yenang choung, road to the Petroleum-wells. (Wall.).

UMBELLIFERÆ.

Conspectus of Species.

* *Umbels simple or irregularly (very rarely regularly) compound. No vittæ in the furrows of the mericarp.*

Trib. 1. *HYDROCOTYLEÆ.* Fruits laterally compressed, the mericarps rounded or acute on the back (not sharply angular).

HYDROCOTYLE. Fruits much compressed. Calyx-teeth minute or obsolete. Petals concave, valvate or imbricate. Umbels simple. Creeping herbs with simple leaves.

Trib. 2. *SANICULEÆ.* Mericarps almost terete or laterally compressed, the commissure broad. Calyx-teeth or lobes usually conspicuous.

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Sanicula. Mericarps echinate from bristles which are often hooked. Flowers pedicelled, polygamous. Bracts small. Umbels very small, usually panicled. Leaves dissected, toothed.

* * *Umbels regularly compound.*

× Primary ribs of the mericarp more or less conspicuous, secondary ones none. Vittæ in the furrows usually conspicuous or obscure, very rarely none.

Trib. 3. *AMMINEÆ.* Fruits laterally compressed, or narrowed or sulcate on both sides of the commissure.

* *Seeds with a convex or almost flat face.*

× Leaves simple. Flowers yellow.

Bupleurum. Umbels compound or rarely the flowers in heads. Calyx-teeth obsolete. Disk-lobes almost flat. Leaves entire, flat.

× × Leaves variously compound. Flowers usually white, rarely yellow.

Apium. Carpophore simple or 2-cleft at the apex. Fruit didymous or ovate, the mericarps almost straight. Petals entire, blunt or acute.

Carum. Carpophore 2-cleft or 2-parted. Fruit ovate or oblong, the ribs rather prominent. Involucre-bracts few and small, or none. Petals notched or 2-lobed. Calyx-teeth obsolete or slightly prominent. Disk-lobes conical, or the disk convex.

Pimpinella. Carpophore 2-cleft or 2-parted. Ribs of the mericarps narrow, the vittæ numerous, conspicuous or very thin. Involucre-bracts few and small, or none, very rarely numerous. Petals white or yellow. Disk-lobes thick, cushion-like or conical. Calyx-teeth obsolete or very rarely small.

Trib. 4. *SESELINEÆ.* Fruits transversely terete or compressed from the back, the commissure broad, the lateral ribs either distinct, or united to the nerve-like or corky-thickened margin which is not dilated.

* *Fruit transversely sub-terete or more or less compressed from the back, the primary ribs not winged.*

× Primary ribs of the mericarps almost equal, not winged.

Fœniculum. Fruits not beaked, the primary ribs thin or thick but not corky, the secondary ones wanting. Calyx-teeth obsolete. Petals entire, yellow.

× × Lateral ribs of the mericarps not winged, confluent with the thick, often corky margin, entire after the dehiscence. Vittæ solitary in the furrows.

Oenanthe. Petals notched or 2-lobed. Carpophore absent. All ribs of the mericarps very blunt and almost corky. Leaves usually pinnate or dissected. Umbels compound.

* * *Fruits compressed from the back or almost terete, all the primary ribs, or only the keeled ones, more or less expanded into thick wings, the wings equal, or the lateral ones broader.*

Selinum. Fruits ovate, somewhat compressed from the back, the ribs equally winged or the lateral ones broader. Disk-lobes conical or depressed. Flowers white or yellowish green.

Trib. 5. *PEUCEDANEÆ.* Fruit much compressed from the back, the lateral ribs dilated into wing-like or broadly swollen margins, remaining entire after the dehiscence.

Peucedanum. Mericarps more or less convex on the middle, (rarely nearly flat) the margins rather thick and sharp, or broadly winged, vittæ solitary in the furrows and conspicuous, or rarely by 2—3 and obsolete, reaching the base of the fruit or sometimes shorter.

HERACLEUM. Petals often radiate. Mericarps flat-compressed or hardly convex at the middle, the margins wing-like; vittæ solitary or rarely by twos in the furrows, often clavate, reaching the base of the fruit or more usually shorter.

× × Secondary ribs of the mericarps filiform, somewhat prominent or winged, rarely all the ribs more or less inconspicuous; vittæ in the furrows or below the secondary ribs conspicuous or obsolete.

Trib. 6. *CAUCALINEÆ.* Fruit almost terete or slightly compressed from the sides, or more so from the back, not winged, or rarely the primary ribs expanded into deeply lobed wings or divided into spines.

* *Mericarps glabrous, the ribs blunt, smooth or wrinkled.*

CORIANDRUM. Fruits almost globose, the broad very blunt secondary ribs hardly prominent. Involucre none.

* * *Mericarps hirsute, bristly or aculeate.*

DAUCUS. Seed with rather flat face. Involucre-bracts usually dissected.

CAUCALIS. Seed deeply sulcate or involute on the face. Involucre-bracts linear or none.

Hydrocotyle, L.

Conspectus of Species.

* *Leaves entire or crenate. Umbels bracted.*

Flowers by 3—4 in the head, sessile; fruits nearly 2 lin. in diameter, each mericarp with 2 hardly prominent ribs, ... *H. Asiatica.*

* * *Leaves more or less lobed, the lobes acute or blunt, crenate or serrate. Umbels without bracts.*

× Peduncles and petioles more or less puberulous.

Flowers numerous, almost sessile or very shortly pedicelled, forming rather crowded terminal head-like umbels, the lower ones solitary and axillary, ... *H. Javanica.*

× × All parts quite glabrous.

Flowers on slender pedicels, forming slender solitary umbels in the axils of the leaves, .. *H. Birmanica.*

1. H. ASIATICA, L. sp. pl. 234; DC. Prod. IV. 62; Roxb. Fl. Ind. II. 682; Wight Icon. t. 565. (*H. cordifolia*, Hf. in Hook. Icon. pl. t. 303).

HAB. Rather frequent in grass-land, especially along river-sides, in cultivated lands chiefly, all over Pegu and Martaban, up to 2500 ft. elevation, and no doubt all over the country; Andamans introduced, and now much spread.—Fr. Febr.

2. H. JAVANICA, Thunb. Diss. II. 415. t. 3; Miq. Fl. Ind. Bat. I. 734. (*H. Nepalensis*, Hook. Exot. Bot. I. t. 30; *H. polycephala*, WA. Prod. I. 366; Wight Icon. t. 1003).

HAB. In the betelnut-plantations of the Martaban hills east of Tounghoo, up to 3000—4000 ft. elevation.

3. H. BIRMANICA, Kurz in Journ. As. Soc. Beng. 1871. 60.

HAB. Upper Tenasserim, Daunat toung, 3000 ft. (Dr. Brandis); Thounggyeen, at 5000 ft. elevation (Revd. Parish).

15

Sanicula, L.

1. S. Europæa, L. sp. pl. 339; DC. Prod. IV. 84; Fl. Dan. II. t. 283; Engl. Bot. II. t. 98. Rchb. Flor. Germ. XXI. t. 1847. (*S. montana*, Reinw. in Bl. Bydr. 832; DC. Prod. IV. 85; Miq. Fl. Ind. Bat. I/1. 736; *S. Javanica*, Bl. Bydr. 852; DC. Prod. IV. 85; *S. elata*, Ham. in Don. Prod. Nep. 183, Wight Icon. t. 1004 and 334 and Spicil. Nilgh. t. 79 and Illustr. t. 117; DC. Prod. IV. 85).

Hab. Ava, Khakyen hills (J. Anderson).—Fl. April.

Bupleurum, L.

1. B. tenue, Don. Prod. Nep. 182; DC. Prod. IV. 128.

Hab. Along grassy outskirts of the drier hill-forests of the Martaban hills east of Tounghoo, as on Nattoung at about 7000 ft. elevation.—Fr. Febr.

Apium, L.

*1. A. graveolens, L. sp. pl. 379; DC. Prod. IV. 101; Engl. Bot. t. 1210.

Hab. Only cultivated in gardens of the drier districts chiefly, as Prome and Ava.—Fl. HS.

Carum, L.

Conspectus of Species.

* *Fruits glabrous.*

Flowers yellowish or greenish yellow, ... *C. Petroselinum.*
Flowers white; calyx-teeth obsolete; fruits oblong, ... *C. Carvi.*

* * *Fruits hirsute or puberulous.* Flowers white.

Leaves ternati-sect, lobes of the segments oblong-linear, ... *C. Roxburghianum.*
Leaves pinnately decompound, the lobes of the segments setaceous, ... *C. Copticum.*

*1. C. Petroselinum, Bth. and Hf. Gen. Plant. I. 891. (*Petroselinum sativum*, Hoffm. Umb. I. 78; DC. Prod. IV. 102; Hayne Arzney Gew. 7. t. 23).

Hab. Only cultivated in gardens of Europeans, chiefly in the drier districts.

2. C. Roxburghianum, Bth. and Hf. Gen. Plant. I. 891. (*Apium involucratum*, Roxb. Fl. Ind. II. 97; *Pimpinella involucrata*, WA.; Wight Icon. t. 567).

Var. α. genuina, all parts minutely puberulous; fruits greyish hirsute.

Var. β. glabriuscula, all parts less puberulous or almost glabrous; fruits slightly puberulous.

Hab. Much cultivated all over the country up to 2000 ft. elevation, and not unfrequently springing up in recently deserted toungyas; var. β. near Prome (Wall.); central parts of the Pegu Yomah, Zamayee (Dr. Brandis).—Fl. Fr. CS.

N. B. *Carum Carvi*, L., and *C. Copticum*, Bth. and Hf. (*Ptychotis Ajowan*, DC.), are numerated by Rev. Mason in his list of Burmese plants as introduced.

Pimpinella, L.

Slender almost glabrous annual; peduncles filiform; umbels without bracts, .. *P. Heyneana.*

Robust pubescent herb; peduncles stout; involucral bracts linear, ½—⅓ as long as the peduncles, .. *P. Parishiana.*

1. P. HEYNEANA, Bth. and Hf. Gen. Plant. I. 894. (*Helosciadium? Heyneanum*, DC. Prod. IV. 106; *Anethum trifoliatum*, Roxb. Fl. Ind. II. 96).

HAB. Locally but socially in the upper mixed forests of the Pegu Yomah.—Fr. Nov., Dec.

2. P. PARISHIANA, Kurz in Journ. As. Soc. Beng. 1872. 309.

HAB. Martaban, on the Zwakabin (Rev. Parish, No. 315).

Habit of *P. diversifolia.*

Fœniculum, Ad.

*1. F. VULGARE, Gærtn. Fruct. I. 105; DC. Prod. IV. 142; Wight Icon. t. 515. (*Anethum Fœniculum*, L. sp. pl. 722; Engl. Bot. t. 1208).

HAB. Cultivated in native gardens and fields, especially in the Prome District.

Œnanthe, L.

Conspectus of Species.

Leaves pinnately decompound; umbels on short leaf-opposed peduncles or almost sessile, ... *Œ. Benghalense.*

Leaves pinnate (rarely bipinnate); umbels on very long peduncles, ... *Œ. stolonifera.*

1. OE. STOLONIFERA, DC. Prod. IV. 138; Wight Icon. t. 571. (*Phellandrium stoloniferum*, Roxb. Fl. Ind. II. 93).

HAB. In swamps and in and around stagnant waters of the alluvial plains of Pegu, here and there, as in the ditches round the fort of Tounghoo; about Rangoon, &c.—Fl. May.

Selinum, L.

1. S. SP.?

A species apparently of this genus is not unfrequent on the hill-pastures of the Martaban hills east of Tounghoo, above 6000 ft. elevation, but the plants (like those of 2 or 3 other umbelliferous plants which grew in company with it) were too much dried up to permit of identification.

Peucedanum, L.

Conspectus of Species.

Glabrous, glaucous; leaves pinnately decompound, the lobes filiform, ... *P. Sowa.*

Leaves pinnate, the leaflets puberulous beneath, broadly oblong, serrate, often lobed, .. *P. Pastinaca,* *1. P. SOWA, Bth. and Hf. Gen. Plant. (*Anethum Sowa*, Roxb. Fl. Ind. II. 96; Wight Icon. t. 572).

HAB. Much cultivated in the plains as well as in the hills up to 2000 ft. elevation, and often springing up in recently deserted toungyas.—Fl. Fr. CS.

*2. P. PASTINACA, Bth. and Hf. Gen. Plant. (*Pastinaca sativa*, L. sp. pl. 376; DC. Prod. IV. 188).

HAB. Only cultivated, especially in gardens of Europeans.

Heracleum, L.

1. H. BIRMANICUM, Kurz in Journ. As. Soc. Beng. 1872. 309.

HAB. Frequent in the upper dry forests of the highest crests of the Pegu Yomah, on and around the Kambala-toung, at 2500 to 3000 ft. elevation.—Fl. Febr.

This plant forms a very conspicuous feature on the ridges referred to, but, unfortunately, all the specimens were so perfectly dried-up and withered that it was impossible to give a full description of the species. It is nearest to *Heracleum* No. 5 of Hf. and Th. collection from the Khasi hills and eventually may be referable to it.

Coriandrum, L.

*1. C. SATIVUM, L. sp. pl. 367; DC. Prod. IV. 250; Wight Icon. t. 516.

HAB. Ava, on Taong dong (Wall.) and Bhamo (J. Anderson), most probably only cultivated.—Fl. Fr. Nov. Febr.

Daucus, L.

*1. D. CAROTA, L. sp. pl. 348; DC. Prod. IV. 211; Roxb. Fl. Ind. II. 90.

HAB. Only cultivated, especially in European kitchen-gardens of the drier districts.

ARALIACEÆ.

Conspectus of Genera.

Trib. 1. *ARALIEÆ.* Petals more or less imbricate, broad at the base.

ARALIA. Gynœcium 2—5-merous. Styles free. Fruit angular in a dried state. Pedicels jointed. Leaves usually pinnate or decompound.

Trib. 2. *HEDEREÆ.* Petals valvate in bud.

* *Stamens as many as petals.*

× Albumen homogeneous. (*Panaceæ.*)

+ Ovary 2- (rarely 1-, 3-, or 4-) celled, the cells usually fewer in number than the petals.

† Styles distinct from the base or from a conical base.

PANAX. Fruits laterally compressed or didymous, rarely 3—4-angular. Filaments filiform. Styles distinct, at length recurved, the stigmas more or less decurrent on the inner side. Umbels, heads, or racemes forming compound inflorescences, rarely simple. Leaves various.

† † Styles united into a cone or column.

Brassaiopsis. Flowers 5-merous. Fruits terete. Ovary 2—1-celled. Pedicels not jointed. Umbels forming large terminal racemes. Leaves palmatifid, rarely digitate.

+ + Ovary 5- or more- (rarely by abortion 3—4-) celled.

Heptapleurum. Flowers 5—6- (rarely 4- or 7—8-) merous. Drupes angled and ribbed in a dried state. Umbels, heads, or racemes forming large compound inflorescences. Pedicels not jointed.

Trevesia. Flowers 8—12-merous. Drupes globular, sulcate or ribbed. Umbels panicled. Leaves palmatifid, digitate, or pinnate. Pedicels not jointed.

× × Albumen ruminate. (*Hedereæ*).

+ Ovary 1-celled.

Arthrophyllum. Pedicels not jointed. Umbels compound. Leaves pinnate or simple.

+ + Ovary 2- or rarely 3-celled.

† Pedicels not jointed with the calyx.

Heteropanax. Styles distinct, filiform. Umbels racemose, in panicles. Leaves pinnately decompound.

† † Pedicels jointed under the calyx.

Macropanax. Styles united into a cone or column. Umbels or heads forming panicles. Leaves digitate.

* * *Stamens numerous, and more numerous than the petals. Styles none or connate. Petals valvate or firmly cohering.* (Pleurandræ).

Tupidanthus. Petals firmly cohering into a thick mitre. Gynœcium poly- (up to 100-) merous. Leaves digitate.

Aralia, L.

1. A. armata, Seem. Journ. Bot. VI. 134. (*Panax armatum*, Wall. ap. G. Don. Gen. Syst. III. 386; Walp. Rep. II. 429).

Hab. Tenasserim, near Tavoy (Wall. Cat. 4933).—Fl. Aug.

Panax, L.

Conspectus of Species.

Leaves decompoundly 3-pinnate, the segments spiny-serrate, ... *P. fruticosum.*
Leaves 1-foliolate, ... *P. cochleatum.*

*1. P. fruticosum, L. sp. pl. 1515; Roxb. Fl. Ind. II. 76; Wight Icon. t. 573. (*Nothopanax fruticosum*, Miq. Fl. Ind. Bat. I/1. 765).

Hab. Here and there cultivated in villages of Pegu and elsewhere.

Brassaiopsis, Dcne. and Planch.

1. B. palmata, Kurz in Journ. As. Soc. Beng. 1870. 77. (*Panax palmatum*, Roxb. Fl. Ind. II. 74; *Araliopsis Andamanica*, Kurz in And. Rep. App. B. 9).

Hab. Chittagong (Roxb.); here and there in the tropical forests of the Andamans.—Fr. May, June.

Heptapleurum, Gærtn.

Conspectus of Species.

Subg. 1. *Heptapleurum*, Seem. Stigmas immersed on the ovary, dot-like.
Climber; leaves and inflorescence glabrous, ... *H. venulosum.*
Subg. 2. *Agalma*, Miq. Styles united into an elongate column.
Leaflets on thick rather short petiolules, entire, ... *H. glaucum.*
Leaflets on very long, slender petiolules, usually pinnati-lobed, ... *H. hypoleucum.*

1. H. VENULOSUM, Seem. Journ. Bot. III. 80. (*Paratropia venulosa*, WA. Prod. I. 377; Wight Ill. t. 118; *Aralia digitata*, Roxb. Fl. Ind. II. 107).

HAB. Frequent in the mixed forests all over Burma from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. April, May.

2. H. GLAUCUM, Bth. and Hf. Gen. Plant. (*Agalma glaucum*, Seem. Journ. Bot. II. 299).

HAB. Not unfrequent in the damp hill-forests of the Martaban hills east of Tounghoo, from 6000 ft. elevation upwards.—Fr. March.

3. H. HYPOLEUCUM, Kurz For. Fl. Burm. I. 539.

HAB. Not unfrequent in the drier hill-forests of the Martaban hills east of Tounghoo, at 6000 ft. elevation and higher up; also Ava, Kakhyen-hills (J. Anderson).

Very near allied to the preceding species.

Trevesia, Vis.

1. T. PALMATA, Vis. Mem. Acad. Torin. ser. 2. IV. 262, (*Gastonia palmata*, Roxb. Fl. Ind. II. 407; Bot. Reg. t. 894; *T. Burmanica*, T. Anders. in Proc. Agri. Hort. Soc. Ind. 1867. 20).

HAB. Common in the tropical forests all over Burma from Chittagong and Ava down to Tenasserim, up to 4000 ft. elevation.—Fl. March, April; Fr. June.

The leaves in this species vary very much in cut, the base of the lobes being often abruptly reduced to the midrib only.

Arthrophyllum, Bl.

1. A. JAVANICUM, Bl. Bydr. 879. (*A. ellipticum* Bl. l. c.; *A. Blumeanum*, Zoll. and Mor. Syst. Verz. 41; Miq. Fl. Ind. Bat. I/1. 768).

HAB. In the tropical forests of the western coasts of South Andaman (Port Mouat).—Fl. Febr. March.

Heteropanax, Seem.

1. H. FRAGRANS, Seem. Fl. Vit. 114. in adnot. and Journ. Bot. IV. 297. (*Panax fragrans*, Roxb. Fl. Ind. II. 76).

HAB. Frequent in all leaf-shedding forests, from Chittagong and Ava to Pegu and Martaban, up to 3000 ft. elevation.—Fl. Jan. Febr.; Fr. May, June.

Macropanax, Miq.

1. M. OREOPHILUM, Miq. Fl. Ind. Bat. I/1. 764.

HAB. Not unfrequent in the hill-forests, especially the damper ones, of the Martaban hills east of Bhamo, above 4000 ft. elevation; Ava, Kakhyen hills (J. Anderson).

Tupidanthus, Hf. and Th.

1. T. CALYPTRATUS, Hf. and Th. in Bot. Mag. t. 4908.

HAB. Arracan hills (Theobald).

CORNACEÆ.

Conspectus of Genera.

* *Petals narrow-linear, valvate. Anthers basifix. Style elongate. Leaves alternate.*

ALANGIUM. Stamens usually 2 to 4 times the number of the petals. Ovary 1-celled. Albumen ruminate. Flowers clustered or fascicled.

MARLEA. Stamens as many as petals. Ovary 1—3-celled. Albumen homogeneous. Flowers cymose-panicled.

* * *Petals short, valvate. Anthers dorsifix. Style short.*

CORNUS. Petals 4. Ovary 2-celled, with a simple stigma. Leaves usually opposite.

Alangium, Lamk.

Conspectus of Species.

A tree, spiny-armed; petioles 6—8 lin. long; petals 10—6; filaments densely pilose at the base; bracts and bractlets broadly ovate, very deciduous, ..*A. decapetalum.*

A large climber, unarmed; petioles shorter; petals 6; filaments sparingly pilose at the base; bracts and bractlets linear-oblong, longer persistent,.... *A. Sundanum.*

1. A. DECAPETALUM, Lamk. Encycl. Dict. I. 174; DC. Prod. III. 203; WA. Prod. I. 72; Wight Icon. t. 194; Voigt Cat. Hort. Calc. 40 cum syn. (*A. hexapetalum*, Lamk. l. c.; DC. l. c.; WA. l. c. 326; Wight Ill. II. t. 96; Roxb. Fl. Ind. II. 502; *A. tomentosum*, Lamk. l. c.; DC l. c.; Rheed. Hort. Malab. IV. t. 17.; *A. Lamarckii*, Bedd. Fl. Sylv. t. 215).

HAB. Burmah (according to Rev. Dr. Mason).—Fl. HS.

The above synonymy probably includes two different species. I suspect that Thwaites' *A. Lamarckii* is a climber. The calyx-tube is apparently sulcate-ribbed.

2. A. SUNDANUM, Miq. Fl. Ind. Bat. I/1. 772 and Suppl. Fl. Sumatr. 341.

Var. α. MIQUELIANA, flowers on pedicels $\frac{1}{3}$—$\frac{2}{3}$ in. long.

Var. β. INSULARUM, pedicels only 2—3 lin. long.

HAB. Var. β. In the tropical forests of the Andamans.—Fl. March, April.

Marlea, Roxb.

Conspectus of Species.

Petals about ½ in. long or shorter; anthers with a glabrous connective; leaves glabrous, .. *M. begoniæfolia.*

Petals nearly an inch long; anther-connective pilose and bearded; leaves puberulous beneath, .. *M. tomentosa.*

1. M. BEGONIÆFOLIA, Roxb. Corom. Pl. III. t. 283 and Fl. Ind. II. 261; DC. Prod. IV. 267; Bot. Reg. t. 61; Miq. Fl. Ind. Bat. I/1. 774; Dcne. in Jacq. Voy. Bot. t. 83. (*Styrax Javanicum*, Bl. Bydr. 671).

HAB. Tropical forests of Martaban east of Tounghoo; Ava, hills east of Bhamo.—Fl. March.

2. M. TOMENTOSA, Endl. Gener. No. 6097 and Suppl. III; Hassk. in Flora 1844. 605; Miq. Fl. Ind. Bat. I/1 775. (*Diacicarpium rotundifolium*, Hassk. in Bonpl. VII. 172).

HAB. Not unfrequent in the tropical forests of Martaban; Tenasserim, Thounggyeen.—Fl. March, April.

Cornus, L.

1. C. OBLONGA, Wall. in Roxb. Fl. Ind. I. 432; DC. Prod. IV. 272.

HAB. Frequent in the drier hill-forests of the Martaban hills east of Tounghoo, at 4000 to 7000 ft. elevation.—Fl. Fr. March.

CAPRIFOLIACEÆ.

Conspectus of Genera.

Trib. 1. *SAMBUCEAE.* Corolla rotate or shortly tubular. Stigmas 3, sessile or on a very short style. Raphe introrse or lateral.

VIBURNUM. Ovary 1- rarely 2- or 3-celled. Berry by abortion 1-celled and 1-seeded. Leaves simple.

SAMBUCUS. Ovary 3—5-celled. Berry with 3 to 5 pyrenes. Leaves unpaired, pinnate or pinnatisect.

Trib. 2. *LONICEREAE.* Corolla-tube more or less elongate. Style filiform. Raphe extrorse.

LONICERA. Corolla tubular. Ovary and berry 2—3-celled, or the berry 1-celled by absorption of the septa.

SCYPHIPHORA. Corolla tubular-funnel-shaped, regular; ovary 2-celled, with a parietal 2-ovuled placenta protruding into the cells so as to form a spuriously 4-celled ovary; fruit a drupe.

Viburnum, L.

Conspectus of Species.

Leaves more or less stellately pubescent beneath; corymbs terminal, ... *V. fœtidum.*

Leaves glabrous; corymbs usually on axillary short branchlets; berries about 2 lin. long, broadly ovate, ... *V. Colebrookeanum.*

As preceding, but berries nearly 4 lin. long, elliptically oblong; corymbs terminal, .. *V. lutescens.*

1. V. FŒTIDUM, Wall. Cat. 466 and Pl. As. Rar. I. 49. t. 61; DC. Prod. IV. 325; Hf. and Th. in Linn. Proc. II. 175.

Var. β. PREMNACEA, Hf. and Th. l. c. (*V. premnaceum*, Wall. Cat. 461; DC. Prod. l. c.), corymb involucred by 3 or 4 small leaves, rest as in the typical form.

Var. γ. GRIFFITHIANUM, all parts more robust and more densely stellate-pubescent; leaves about 4 in. long, acuminate, 6—7-nerved on each side, the lower nerves not meeting at the base (in varr. α. and β. the leaves are trinerved at the base and, besides, have only 2—3 lateral nerves on each side). Most probably a good species.

HAB. Var. α. Ava, Taong-dong (Wall.); Var. γ. Burma, probably Ava (Griff. 3403).—Fr. Nov.

2. V. COLEBROOKEANUM, Wall. Cat. 460; DC. Prod. IV. 327.

HAB. Ava, Kakhyen hills; probably Hookhoom valley (Griff. 3398).

Sambucus, L.

1. S. THUNBERGIANA, Bl. ap. Miq. Ann. Mus. Lugd. Bat. II. 265.—

HAB. Ava, Khakyen hills (J. Anderson).—Fl. May.

Apparently well-distinguished from *S. adnata*, Wall., and occurs also in the Khasi hills.

Lonicera, L,

1. L. LEIANTHA, Kurz in Journ. As. Soc. Beng. 1874. 188.

HAB. Ava, Kakhyen hills (J. Anderson).—Fl. April.

Scyphiphora, Gærtn.

1. S. HYDROPHYLLACEA, Gærtn. Fruct. III. 91. t. 196; DC. Prod. IV. 377. (*Epithinia Malayana*, Jack in Mal. Misc. I. 12; WA. Prod. I. 424; *Epithiniæ* sp. Griff. Not. Dicot. 269. t. 478 and (sub nom. *Lumnitzera*) t. 644. A).

HAB. Not unfrequent in the mangrove swamps of the Andaman islands.—Fl. May.

RUBIACEÆ.

Conspectus of Genera.

Subd. 1. *CINCHONEÆ.* Fruit a dehiscent capsule, dry or very rarely succulent, very rarely a berry or drupe and in this case the seeds always winged or appendaged. Ovary 2 to more-celled, with 1 to many ovules in each cell. Seeds various. Stipules interpetiolar.

* *Ovules numerous in each cell. Capsule dry or more or less succulent.*

Trib. 1. *NAUCLEEÆ.* Flowers inserted upon a thickened receptacle and forming heads. Capsule dehiscing from the base or otherwise, dry or rarely (in *Sarcocephalus*) berry-like.

× Capsule berry-like, dehiscing from the base. Trees.

Sarcocephalus. Capsule 2-celled, or the 2 cells augmented by 2 superposed empty cells, more or less united in a fleshy syncarp.

× × Capsule dry, dehiscing loculicidally or septicidally into two many-seeded cocci. Trees or erect shrubs.

Nauclea. Flowers without bractlets. Capsule 2-celled. Trees or erect shrubs.

Stephegyne. Flowers surrounded by angular-club-shaped bractlets. Capsule 3-celled. Trees.

Uncaria. Flowers sessile or pedicelled, destitute of bractlets. Capsule dehiscing in longitudinal slits. Scandent hook-bearing shrubs.

Trib. 2. *EU-CINCHONEÆ.* Flowers panicled or corymbose, never in heads. Capsule 2-celled, dehiscing septicidally into 2 valves or into 4 apical valves.

× Capsule septicidally dehiscing into 2 woody valves.

+ Corolla imbricate.

Luculia. Calyx-limb deciduous. Stamens included. Corymbs terminal, without floral leaves. Trees.

+ + Corolla valvate.

Hymenodictyon. Inflorescence furnished with conspicuous discoloured floral leaves. Trees.

× × Capsule dehiscing at the apex into 4 valves. Corolla valvate.

Hymenopogon. Inflorescence furnished with conspicuous discoloured floral leaves. Epiphytical shrubs.

Trib. 3. *HEDYOTIDEÆ.* Ovary 2—4-celled, the cells many- or few-ovuled, the ovules laterally attached. Capsule dehiscing in various ways or separating into 2—4 cocci, rarely indehiscent.

× Stipules connate or free, neither sheathing nor setaceously fringed (*Rondeletieæ*).

+ Stigma 2-lobed or 2-cleft. Corolla imbricate or twisted. Anther-cells blunt.

Wendlandia. Corolla tubular, twisted. Capsule opening into two apical valves. Trees or shrubs.

Spiradiclis. Corolla-tube short. Capsule dehiscing into two valves which again separate into 2 valves inflected with their margins. Erect herbs.

Ophiorrhiza. Corolla funnel-shaped or tubular. Placenta free, erect. Capsule compressed, divaricately 2-lobed, opening loculicidally by an apical slit. Herbs.

+ + Stigma capitate. Corolla valvate. Anther-cells prolonged into a setaceous sterile appendage.

Argostema. Corolla almost rotate, the limb 3—5-cleft. Anthers dehiscing longitudinally or by 1 or 2 apical pores. Capsule dehiscing by 4 apical valves. Herbs of the habit of *Sonerila*.

× × Stipules adnate to the petiole and sheathing at the base, setaceously fringed. (*Eu-Hedyotideæ.*)

Dentella. Flowers 5-merous, the petals 2- or 3-toothed. Capsule indehiscent.

Hedyotis. Flowers 4—5-merous, the petals entire. Capsule dehiscing loculicidally or septicidally, rarely almost indehiscent.

Scleromitrion. As preceding, but capsule separating into 2 or 4 several-seeded cocci.

* * *Ovules and seeds solitary in each cell.*

Trib. 4. *SPERMACOCEÆ.* Capsules distinct, dehiscing, or separating into cocci, rarely indehiscent. Flowers not in heads. Corolla without toothlets between the lobes. Corolla valvate. Radicle inferior.

Spermacoce. Ovule attached to or below the middle of the cell. Capsule dehiscing septicidally from the apex. Herbs.

Hydrophylax. As preceding, but capsules indehiscent. Herbs.

Knoxia. Ovule attached at or below the summit of the cell. Capsule dehiscing from the base into two deciduous cocci, leaving the persistent setaceous axis. Herbs.

Trib. 5. *CEPHALANTHEÆ.* Capsules indehiscent, usually united into a syncarp. Corolla imbricate. Radicle superior.

Cephalanthus. Corolla-lobes with toothlets in their sinuses. Capsules berry-like, connate. Flowers in heads.

Subord. II. EU-RUBIACEÆ. Fruit a more or less fleshy drupe or rarely a berry 1 to many-celled. Ovary-cells 1 to many-ovuled. Seeds never winged nor appendaged. Stipules interpetiolar or developed into leaves, or rarely none.

* *Stipules interpetiolar, various.*

+ Seeds enclosed in pyrenes of a coriaceous, crustaceous, or chartaceous texture. Ovules solitary in each cell. Radicle inferior.

Trib. 1. *PÆDERIEÆ.* Ovule and the seed pendulous. Drupe dry, crustaceous or chartaceous, irregularly rupturing.

Pæderia. Corolla valvate. Cocci thin-chartaceous, expanded into wings. Twiners, the leaves opposite or whorled.

Trib. 2. *COFFEEÆ.* Ovary 2—9- (very rarely 1-) celled, the solitary ovules erect or attached to the middle of each cell. Berry consisting of 2 or more (rarely a single) one-seeded coriaceous or chartaceous pyrenes.

* *Ovules erect and basal. Albumen often fleshy. Corolla valvate.*

× Ovary 4—9- (rarely 2-) celled. (*Lasiantheæ*).

Lasianthus. Calyx more or less toothed. Styles and ovary-cells 4—9. Flowers clustered or cymose, axillary. Shrubs.

× × Ovary 2- (very rarely 1-) celled. (*Psychotrieæ*).

Nertera. Flowers hermaphrodite or unisexual. Corolla 4- or 5-lobed. Style 2-parted almost to the base, hirsute. Creeping herbs.

Cephaëlis. Corolla funnel-shaped, the tube long. Calyx 4- or 5-toothed or -lobed. Flowers in heads or solitary, axillary. Herbs or under-shrubs.

Hydnophytum. Calyx-limb entire. Corolla-tube short. Flowers sessile, clustered. Epiphytical shrubs with tuberous trunks.

Psychotria. Corolla-tube short, the throat bearded. Pyrenes flat or entire on the inner face. Flowers cymose or cymosely panicled. Shrubs, rarely scandent.

Chasalia. Corolla-tube elongate, the throat naked. Pyrenes carved out on the inner face along the central placenta. Inflorescence of *Psychotria*. Shrubs or under-shrubs.

Saprosma, Corolla funnel-shaped, velvety, often almost oblique. Berry 1- rarely 2-seeded. Flowers terminal and axillary. Stipules free. Shrubs or trees.

* * *Ovules attached to the middle or above the middle of the septum. Corolla twisted. Albumen often horny.* (Ixoreæ).

Coffea. Corolla funnel-shaped, the limb 4—7-parted. Berry 2 or rarely 1-seeded, the pyrenes chartaceous. Flowers terminal and axillary. Stipules free.

IXORA. Corolla salver- or nearly funnel-shaped, the limb 4- or 5-parted. Flowers corymbose or panicled. Stipules connate.

Trib. 3. *MORINDEÆ.* Ovary 2—4-celled, the solitary ovules attached to the middle or below the middle of the cell. Corolla valvate. Berries free or often united in a syncarp.

* *Berries free, not connate.*

GYNOCHTODES. Calyx-limb truncate. Style 2-cleft. Ovary 4-celled. Flowers clustered, axillary. Scandent shrubs.

* * *Berries united into fleshy syncarps.*

MORINDA. Berries fleshy. Pyrenes appendaged. Trees or shrubs.

+ + Seeds free, not enclosed in distinct pyrenes.

Trib. 4. *VANGUERIEÆ.* Ovary many-celled, the cells with a solitary pendulous ovule attached above the middle or near the apex of the cells. Fruit a drupe, the putamen 1 to many-celled. Albumen usually fleshy. Radicle superior.

* *Corolla valvate. Ovule attached laterally or below the summit of the cell.* (Eu-Vanguerieæ).

VANGUERIA. Stigma discoid. Ovary usually 5-celled.

PLECTRONIA. Ovary 2-celled, the stigma capitate, oblong or mitre-shaped. Drupe didymous or occasionally almost 1-celled by abortion.

* * *Corolla imbricate. Ovule suspended from the summit of the cell.*

GUETTARDA. Stigma simple, thick. Drupe globose, rather large, the putamen many-celled.

POLYPHRAGMON. Stigmas as many as ovary-cells. Berry 5—10-celled, the seeds pyrene-like. Anomalous genus.

Trib. 5. *RANDIEÆ.* Ovary 1-celled, with parietal placentas or more usually 2- or more-celled, with numerous ovules in each cell.

* *Corolla imbricate or twisted.*

× Ovary 1-celled, with 4 or 5 parietal placentas. (*Gardenieæ*).

GARDENIA. Flowers often conspicuous. Stigma entire, sulcate-twisted. Berry usually large, many-seeded, the seeds imbedded in pulp.

× × Ovary 2-celled (*Eu-Randieæ*).

RANDIA. Stigma 2-lobed; style thickened spindle-like. Berry large, the seeds imbedded in pulp. Trees or shrubs, erect.

GRIFFITHIA. Stigma 2-lobed; style not thickened. Berries small, not pulpy. Scandent shrubs, often armed.

WEBERA. Stigma simple; style not thickened, filiform. Berries small, not pulpy. Erect trees or shrubs, unarmed.

DIPLOSPORA. Style 2-cleft. Berries rather large, not pulpy. Seeds in 2 rows in each cell. Erect trees or shrubs, unarmed.

HYPOBATHRUM. Styles 2-lobed. Berry small, stalked or sessile, not pulpy. Seeds in a single row in each cell. Erect shrubs or trees.

BRACHYTOME. Flowers polygamously diœcious. Corolla funnel-shaped, glabrous. Style shortly 2-lobed. Berry small, not pulpy. Seeds very numerous. Erect shrubs.

MORINDOPSIS. Flowers diœcious, in peduncled heads. Calyx-limb cupular or 4-toothed. Corolla-throat villous. Style hirsute. Berry elongate, cylindrical, the numerous seeds imbricately pendulous, almost appendaged. Trees.

* * *Corolla valvate.*

× Ovary 2-celled, the placentas 2-cleft. Corolla reduplicate-valvate. (*Mussændeæ*).

MUSSÆNDA. The one or other calyx-lobe of the outer flowers extended into a discoloured leaf. Connective not mucronate. Style-branches 2.

ACRANTHERA. Calyx-teeth all conform, not appendaged. Connective mucronate-produced. Stigma clavate.

×. × Ovary usually 5—6- (rarely 2—3-) celled, the placentas simple. (*Urophylleæ.*)

ADENOSACME. Calyx 5—4-cleft. Corolla-throat naked. Ovary 5—3-celled. Cymes or corymbs terminal or nearly so, rarely lateral.

MYRIONEURON. As preceding, but ovary 2-celled.

UROPHYLLUM. Calyx entire or minutely toothed. Corolla-throat bearded. Flowers clustered or cymose, axillary.

* * *Stipules transformed into leaves and forming whorls, or rarely the leaves opposite and the stipules wanting.*

Trib. 6. *STELLATÆ.* Calyx entirely adnate to the calyx or the calyx-limb 4—6-cleft. Corolla valvate. Ovary 2-celled, the ovules solitary, erect or ascending. Drupe indehiscent, dry or sappy, often didymous.

RUBIA. Flowers 5-merous. Drupe sappy. Erect or twining herbs.

GALIUM. Flowers 4-merous. Drupe usually didymous or globose, dry. Herbs or under-shrubs.

Sarcocephalus, Afz.

Conspectus of Species.

Subg. 1. *Eu-Sarcocephalus.* Capsules succulent and connate, 2-celled throughout. All parts glabrous, the young branchlets pruinous; leaves more or less acuminate, .. *S. Cadamba.*

Subg. 2. *Anthocephalus.* Capsules less succulent, not connate, 2-celled with 2 superposed spurious sterile cells.
Young shoots glabrous or pubescent; leaves more or less blunt, ... *S. cordatus.*

1. S. CADAMBA, (*Anthocephalus Cadamba*, Miq. Fl. Ind. Bat. II. 135; Bedd. Fl. Sylv. t. 35; *Nauclea Cadamba*, Roxb. Fl. Ind. I. 513).

HAB. In the moister upper mixed forests of the eastern slopes of the Pegu Yomah, descending into the lower mixed forests.—Fl. Decb.

2. S. CORDATUS, Miq. Ind. Bat. II. 133; Bedd. Fl. Sylv. t. 318. (*Nauclea cordata*, Roxb. Fl. Ind. I. 509; *Nauclea coadunata*, Sm. in Rees. Cycl. XXIV; DC. Prod. IV. 344; *Nauclea Wallichiana*, R. Br. in Wall. Cat. 6098; Don. Gen. Syst. III. 467).

Var. *α*. GLABRA, leaves and all other parts quite glabrous.

Var. *β*. PUBESCENS, leaves beneath, petioles, stipules, and peduncles shortly and softly pubescent.

HAB. Both varieties frequent in the mixed forests (especially the lower ones) and in the savannahs, all over Pegu and Martaban down to Tenasserim.—Fl. May.

Nauclea, L.

Conspectus of Species.

Subg. 1. *Eu-Nauclea.* Corolla slightly imbricate in bud. Flowers without bractlets. Flowers solitary or by threes, terminal.

* All parts (at least the leaves) glabrous.

Leaves acuminate, the petiole $\frac{1}{2}$—1 in. long; flower-heads often by threes, ... *N. excelsa.*

Leaves blunt, almost sessile; flower-heads solitary, ... *N. sessilifolia.*

* * All parts more or less pubescent.

Leaves cordate, petioled; flower-heads by 1—3, axillary, ... *N. cordifolia.*

Subg. 2. *Adina*, Salisb. Corolla valvate. Flowers surrounded by bractlets.

* Flower-heads small, panicled.

All parts glabrous; leaves petioled, ... *N. polycephala.*

* * Flower-heads larger, panicled. Bractlets angular-club-shaped.

× Petiole very slender and thin; leaves thin-membranous, acute at the base.

Bractlets only half as long as the calyx; corolla-lobes about $\frac{1}{4}$ the length of the corolla-tube; flower-heads more constantly solitary between 2 floral leaves, .. *N. parvifolia.*

Bractlets as long as the calyx; corolla-lobes about $\frac{1}{4}$ the length of the tube; floral leaves very deciduous, the flower-heads soon forming dichotomous divaricate panicles, ... *N. diversifolia.*

× × Petiole very thick and pubescent; leaves large, cordate at the base.

Flower-heads dichotomously panicled; leaves wrinkled above; corolla-lobes as long as the short tube, ... *N. rotundifolia.*

1. N. EXCELSA, Bl. Bydr. 1009; Miq. Fl. Ind. Bat. II. 139. (*N. peduncularis,* Wall. Cat. 6091; Don. Gen. Syst. III. 469; Bedd. Icon. t. 235?).

HAB. Pegu Yomah, at Myodwine (Dr. Brandis).—Fl. Octob.

2. N. SESSILIFOLIA, Roxb. Fl. Ind. I. 515. (*N. sericea,* Wall. Cat. 6095; Don. Gen. Syst. III. 467).

HAB. Frequent in the mixed forests, especially the upper ones, and in the savannahs, all over Pegu; also Chittagong.—Fl. end of RS.; Fr. Decb., Jan.

3. N. CORDIFOLIA, Roxb. Corom. Pl. I. t. 53 and Fl. Ind. ed. Wall. II. 122; DC. Prod. IV. 346; WA. Prod. I. 391. (*Adina cordifolia,* Bth. and Hf. in Brand. For. Fl. 263. t. 33; Bedd. Fl. Sylv. t. 33).

HAB. Frequent in the leaf-shedding forests, especially the lower ones, but also in the low and dry forests, from Ava and Martaban to Prome and Pegu, up to 1500 ft. elevation.—Fl. HS.; Fr. Begin of CS.

4. N. POLYCEPHALA, Wall. Cat. 6100; Don. Gen. Syst. III. 467. (*Adina polycephala,* Bth. Fl. Hongk. 146; Miq. in Ann. Mus. Lugd. Bat. III. 183; *N. aralioides,* Miq. Fl. Ind. Bat. II. 344).

HAB. Chittagong (Hf. and Th.); Tenasserim (Griff. 2751).

5. N. PARVIFOLIA, Roxb. Corom. Pl. I. 40. t. 82. and Fl. Ind. I. 513; DC. Prod. IV. 344.; Wight Ill. t. 123.—(*Stephegyne parvifolia*, Korth. in Verh. Nat. Gesch. Bot. 161; Bedd. Fl. Sylv. t. 34).

Var. *α*. GENUINA, bractlets only half as long as the calyx; flower-heads more constantly solitary between 2 longer-persistent floral leaves.

Var. *β*. DIVERSIFOLIA, (*N. diversifolia*, Wall. Cat. 6096; Don. Gen. Syst. III. 467), leaves much larger, from 3 to 6 in. long, beneath more conspicuously pubescent; stipules pubescent; bractlets as long as the calyx.

Var. *γ*. MICROPHYLLA, leaves small, only 1—2 in. long, minutely and inconspicuously pubescent beneath; stipules glabrous; bractlets as long as the calyx.

HAB. Var. *α*. not yet found in Burma; var. *β*. frequent in the mixed forests and in savannahs, all over Burma from Ava and Martaban down to Upper Tenasserim; var. *β*. exclusively in the savannahs.—Fl. Sept., Oct. Fr. CS.

6. N. ROTUNDIFOLIA, Roxb. Fl. Ind. I. 516, non Bartl. (*N. Brunonis*, Wall. Cat. 6097; Don. Gen. Syst. III. 467).

HAB. Frequent in the mixed forests, especially the upper and lower ones, all over Pegu and Martaban down to Tenasserim; also Chittagong. —Fl. end of RS.; Fr. CS.

Uncaria, Schreb.

Conspectus of Species.

* *Capsule long-stalked. Leaves more or less pubescent beneath.*

Flowers large, the pedicels 1—2 lin. long, velvety; calyx ½ in. long; corolla hirsute, .. *U. ferruginea.*

Flowers almost sessile; calyx 2 lin. long; corolla velvety, ... *U. sessilifolia.*

** *Capsule sessile.*

× Calyx-limb long-toothed.

All parts more or less woolly pubescent, ... *U. pilosa.*

× × Calyx almost truncate or obscurely 5-toothed. Leaves glabrous.

Leaves green on both sides; corolla glabrous, ... *U. lævigata.*

Leaves glaucous beneath; corolla-lobes velvety, ... *U. sessilifructus.*

1. U. FERRUGINEA, DC. Prod. IV. 348. (*U. speciosa*, Wall. Cat. 6106).

HAB. Tropical forests of the eastern slopes of the Pegu Yomah, as in the Choungmenah valley (Khaboung), rare; Tenasserim, apparently frequent.

2. U. SESSILIFOLIA, Roxb. in Wall. Cat. 6107 and Icon. ined. XVIII. t. 79.

HAB. Tropical forests in the Choungmenah valley (Khaboung) of the eastern slopes of the Pegu Yomah, rather rare; Tenasserim, Tavoy (Wall. Cat. 6106. B).—Fl. Sept., Oct., Fr. March.

Roxburgh's figure represents the leaves as almost sessile. Is Wallich's identification with the above correct?

3. U. PILOSA, Roxb. Fl. Ind. ed. Wall. II. 130; DC. Prod. IV. 348.

HAB. Not uncommon in the tropical forests of the Pegu Yomah and from Martaban down to Tenasserim; also Ava hills.—Fl. begin of RS.; Fr. Nov., Dec.

4. U. LÆVIGATA, Wall. Cat. 6111.

HAB. Rare in the tropical forests of the Choungmenah valley (Khaboung) of the eastern slopes of the Pegu Yomah; Tenasserim, Amherst (Wall.)—Fl. Febr.

5. U. SESSILIFRUCTUS, Roxb. Fl. Ind. I 520; DC. Prod. IV. 349.

HAB. Tropical forests of Pegu and Tenasserim; Ava, Khakyen hills (J. Anderson).—Fr. Nov., Dec.

Luculia, Sw.

1. L. GRATISSIMA, Sweet Brit. Fl. Gard. t. 145; DC. Prod. IV. 358; Bot. Mag. t. 3946; Lodd. Cab. t. 1919.—(*Cinchona gratissima*, Wall. in Roxb. Fl. Ind. II. 154 and Tent. Fl. Nepal. I. 30. t. 21).

HAB. Ava, hills east of Bhamo (J. Anderson).—Fl. Sept.

Hymenodictyon, Wall.

1. H. THYRSIFLORUM, Wall. in Roxb. Fl. Ind. II. 151; DC. Prod. IV. 358. (*Cinchona thyrsiflora*, Roxb. Fl. Ind. I. 529; *H. Horsfieldii*, Miq. Fl. Ind. Bat. II. 158).

HAB. Rather rare in the upper mixed forests of the Pegu Yomah, but frequent in the dry forests of Prome; also Chittagong.—Fl. Aug.; Fr. CS.

Hymenopogon, Wall.

1. H. PARASITICUS, Wall. in Roxb. Fl. Ind. II. 156; DC. Prod. IV. 351.

HAB. Epiphytic on mossy trees of the upper dry forests on the Kambala ridges of the Pegu Yomah, at about 3000 ft. elevation.—Fr. CS.

Wendlandia, Bartl.

Conspectus of Species.

Subg. 1. *Wendlandia.* Flowers 5-merous, sessile or shortly pedicelled, in short spikelets, racemes, or clusters, forming thyrsoid panicles.

* *Calyx-teeth short, triangular-acute.*

All parts and leaves on both sides harshly and shortly pubescent, ... *W. scabra.*

Leaves beneath more or less shortly pubescent or almost glabrescent; panicles pubescent or tomentose, ... *W. tinctoria.*

All parts (also the panicle) quite glabrous; flowers minutely pedicelled, .. *W. glabrata.*

* * *Calyx-teeth subulate-acuminate, as long as or longer than the calyx-tube.*

Leaves coriaceous, glabrous, ... *W. ligustrina,* Leaves lanceolate, membranous, appressed pubescent on the midrib beneath, .. *W. glomerulata.*

Subg. 2. *Greenia,* WA. Flowers 4- or 5-merous, in one-sided spikes, forming divaricate corymbose panicles.

All parts glabrous ; flowers 5—4-merous, ... *W. secunda.*

All parts more or less tawny pubescent ; flowers 4-merous, ... *W. corymbosa.*

1. W. scabra, Kurz in Journ. As. Soc. Beng. 1872. 310.

Hab. Ava, hills east of Bhamo (J. Anderson).—Fr. May.

2. W. tinctoria, DC. Prod. IV. 411 ; Miq. Fl. Ind. Bat. II. 158. (*Rondeletia tinctoria,* Roxb. Fl. Ind. ed. Wall. II. 134).

Hab. Frequent in the open and dry forests, ascending into the drier hill-forests up to 4000 ft. elevation, from Ava and Martaban down to Tenasserim.—Fl. Febr., March ; Fr. March, April.

3. W. glabrata. DC. Prod. IV. 411 ; Miq. Fl. Ind. Bat. II. 158.

Hab. In the drier hill-forests of the Martaban and Tenasserim hills, at 2000—4000 ft. elevation.—Fl. March.

4. W. ligustrina, Wall. Cat. 6272 ; Walp. Rep. II. 505.

Hab. Ava, Taong dong (Wall.) and Kakhyen hills east of Bhamo (J. Anderson) ; Tenasserim (Helfer), a variety with longer corolla-tube.—Fl. Nov. ; March.

5. W. glomerulata, Kurz in Journ. As. Soc. Beng. 1872. 310.

Hab. Tenasserim, Mergui (Helfer).

6. W. secunda, Griff. Not. Dicot. 266. (*Greenia Wightiana,* WA. Prod. I. 404 ; Wight Icon. t. 1161).

Hab. Tenasserim, Mergui, in forests near Culweng (Griff.).—Fl. Aug.

7. W. corymbosa, DC. Prod. IV. 413. (*Rondeletia corymbosa,* Jack in Mal. Misc. I. No. 1. 4. ; *W. spicata,* DC. l. c. ; *Rondeletia spicata,* Wall. in Roxb. Fl. Ind. II. 139 ; *Greenia Jackii,* WA. Prod. I. 404, in adn.).

Hab. Tenasserim (Helfer 2843).

Spiradiclis, Bl.

Conspectus of Species.

Stems, petioles, and inflorescence shortly pubescent ; capsule globular 2-lobed, .. *S. bifida.*

All parts quite glabrous ; capsule oblong, ... *S. cæspitosa.*

1. S. bifida, Kurz in Journ. As. Soc. Beng. 1872. 310. (*Pleotheca ? bifida,* Wall. Cat. 6216 ; Hf. in Bth. and Hf. Gen. pl. II. 62).

Hab. Martaban hills, rare along choungs.

2. S. cæspitosa, Bl. Bydr. 975 ; DC. Prod. IV. 418. (*S. cylindrica,* Hf. in Bth. and Hf. Gen. plant. II. 62).

Hab. Rare along choungs in the hills of Martaban.

Ophiorrhiza, L.

Conspectus of Species.

* *Cymes all terminal, on peduncles 1—3 in. long. Calyx-teeth short, triangular.*

× Bractlets conspicuous, subulate, up to a line long.

All parts glabrous; leaves long-acuminate, ... *O. gracilis.*

× × Bracts subulate, usually persistent, but the bractlets very minute if any.

All parts (also the capsule) glabrous, ... *O. Mungos.*

Stems and petioles brown-pubescent; leaves thick-membranous, whitish beneath; capsule glabrous, ... *O. argentea.*

As preceding, but leaves only pale-coloured beneath, the inflorescence more hispid-pubescent; capsule minutely hispid, ... *O. villosa.*

* * *Cymes terminal and axillary, on very short peduncles only 4—6 lin. long, or almost sessile. Calyx-teeth lanceolate, acute.*

Stem, petioles and peduncles more or less shortly pubescent; lateral branches all shortened, ... *O. erubescens.*

1. O. GRACILIS, Kurz in Journ. As. Soc. Beng. 1872. 311.

HAB. Tenasserim, Attaran (Brandis).

2. O. MUNGOS, L. Amæn. Acad. II. 127; Roxb. Fl. Ind. I. 901; DC. Prod. IV. 414; Miq. Fl. Ind. Bat. II. 166.

Var. *α.* GENUINA, capsule about 3 lin. across, emarginate, the lobes somewhat acute.

? Var. *β.* ORTHOCARPA, capsule about 2 lin. across, truncate at the apex, the lobes blunt or almost truncate.

HAB. Var. *β.* only, Martaban hills, at 3000 ft. elevation (Dr. Brandis).

Dr. Brandis' specimens are not sufficient to enable one to make out whether they should not rather form a distinct species. The true Linnean species is a sea-shore plant, growing chiefly in the beach-forests, most probably also growing along the Burmese coasts.

3. O. ARGENTEA, Wall. Cat. 6229; Walp. Rep. II. 503.

HAB. Chittagong; Arracan, on sandstone rocks in the tropical forests of Boronga island.—Fl. Fr Octob.

Probably not sufficiently distinct from *O. canescens*, Bl.

4. O. VILLOSA, Roxb. Fl. Ind. ed. Wall. II. 546; DC. Prod. IV. 415. (*O. rugosa* Wall. in Roxb. Fl. Ind. II. 546; DC. l. c. 416; Miq. in Ann. Mus. Lugd. Bat. IV. 232; *O. hispidula*, Wall. Cat. 6234; Don. Gen. Syst. III. 523; *O. trichocarpa*, Bl. Bydr. 977; Miq. Fl. Ind. Bat. II. 173).

HAB. Frequent in the tropical forests, from Chittagong and Ava down to Tenasserim and the Andamans. Fl. April, June; Fr. Aug., Sept.

5. O. ERUBESCENS, Wall. Cat. 6233; Don. Gen. Syst. III. 522.

HAB. Not uncommon in the hill-forests of Martaban and Tenasserim (Chappedong-hills, Wall.) at 3000 to 5000 ft. elevation.—Fl. March.

Argostema, Wall.

Conspectus of Species.

* *Flowers 5-merous.*

× Leaves reduced to bract- or stipule-like leaflets, of which only 1 or 2 are fully developed.

All parts glabrous ; leaf solitary ; anthers oblong, blunt, ……………*A. unifolium.*

Umbels stiff-hairy ; leaves two, ……………………………………*A. Tavoyana.*

× × Leaves all developed but very unequal, whorled, or crowded at the apex of the stem.

Glabrous or nearly so ; anthers free, linear, acuminate, opening by terminal pores, ..*A. verticillatum.*

* * *Flowers 4—3-merous.*

Stem, inflorescence, and petiole villous-pubescent ; leaves sparingly pubescent, cordate, bluntish or acute ; flowers in peduncled umbels or cymose umbels, ..*A. soneriloides.*

Quite as preceding, but flowers solitary on a short pedicel, or by 2 or 3 on a very short peduncle, pale rose-coloured, …………………………… *A. oligantha.*

1. A. UNIFOLIUM, Benn. in Horsf. Plant. Jav. rar. 94 ; Miq. Fl. Ind. Bat. II. 161.

HAB. Upper Tenasserim, Moulmein and Attaran (R. Scott, Dr. Brandis).—Fl. July.

In my specimens the anthers are blunt and not beaked as Bennet describes them.

2. A. TAVOYANUM, Wall. ap. Benn. in Horsf. Pl. Jav. rar. 95.

HAB. Tenasserim, Tavoy (Wall.). Unknown to me.

3. A. VERTICILLATUM, Wall. in Roxb. Fl. Ind. II. 325.

HAB. Tenasserim, Moulmein (Rev. Parish, R. Scott).—Fl. July.

4. A. SONERILOIDES, Kurz in Journ. As. Soc. Beng. 1872.

HAB. Pegu, abundant on the pagodas of Rangoon (R. Scott.)—Fl. July, Aug.

5. A. OLIGANTHA, Kurz MS.

HAB. On damp rocks in the coast-forests of South Andaman (Watering Cove).—Fl. June.

A small species of *Argostema*, with slightly pubescent leaves solitary or by pairs, occurs on damp rocks of the tropical forests on Boronga island, Arracan, but the specimens are too few and reduced to admit of description. Its calyx-lobes are blunt or rather retuse.

Dentella, Forst.

1. D. REPENS, Forst. Gen. 26. t. 13 ; DC. Prod. IV. 419 ; Roxb. Fl. Ind. I. 532 ; Miq. Fl. Ind. Bat. II. 196. (*Lippaya telephioides*, Endl. Atakt. 13. t. 13).

HAB. Common in agrarian lands and along river-banks, all over Burma from Chittagong and Ava down to Tenasserim and the Andamans (here introduced only).—Fl. Fr. ∞.

Hedyotis, L.

Conspectus of Species.

* *Capsule loculicidally dehiscent.*

Subg. 1. *Oldenlandia*, L. Capsule more or less hemispherical or obsoletely 2-lobed, opening loculicidally. Annual, rarely perennial herbs.

* *Prostrate or diffuse herbs. Flowers solitary, or in cymes or clusters in the axils of the leaves (rarely also terminal). Root sometimes turning perennial.*

× Leaves more or less oval, petioled.

Flowers solitary, sessile or nearly so. .... *H. tinervia.*

× × Leaves linear to narrow-linear, rarely lanceolate, more or less sessile.

+ Flowers solitary or by 2—3 on an axillary peduncle.

Flowers solitary, on very short strong pedicels; leaves membranous, flat, ..*H. ramosissima.*

Flowers by 2—3, rarely solitary, on a capillary peduncle; pedicels very long and capillary; leaves membranous, flat, ... *H. biflora.*

+ + Flowers by 4 or more, forming axillary and terminal clusters or cymes. Leaves more or less revolute on their margins, somewhat rigid.

Flowers in peduncled cymes or the cymes umbel-like, ... *H. umbellata.*

Flowers in sessile clusters, ... *H. angustifolia.*

* * *Erect annuals. Flowers in terminal panicles or cymes, or solitary, rarely the inflorescence also axillary.*

× Leaves sessile or nearly so.

Leaves sagittate at the base, shortly bristly rough; flowers pale-blue, by 3—4 terminal, and also singly from the leaf-axils; pedicels long and capillary, ... *H. linoides.*

Leaves linear; corolla about an inch long, brownish purple, ... *H. gracilis.*

× × Leaves more or less petioled, more or less tapering at the base.

+ Calyx only $\frac{1}{3}$—$\frac{1}{2}$ lin. long.

All parts sparingly pilose; leaves acute; cymes peduncled, axillary and terminal; pedicels capillary, 3—4 lin. long, ... *H. Wallichii.*

Stem villous-pubescent, the leaves often whorled at the end of the nude scape-like stem; cymes divaricate, peduncled, terminal; pedicels capillary, 2—4 lin. long, ..*H. spergulacea.*

+ + Calyx $\frac{3}{4}$—2 lin. long. Flowers in racemes or cymes, terminal and in the axils of the upper-leaves.

Glabrous, more or less succulent; flowers slenderly pedicelled; capsule not winged, the crowning calyx-lobes very short, ... *H. paniculata.*

Stems, and nerves beneath, shortly pubescent; flowers sessile or nearly so; capsule more or less compressed and winged, the crowning lobes nearly a line long. ..*H. Andamanica.*

* * *Capsules opening septicidally.*

Subg. 2. *Dimetia*, WA. Capsule opening septicidally at the apex by a gaping short slit, more or less truncately hemispherical and obscurely 2-lobed. Scandent, diffuse or erect perennials. Flowers in small heads, forming axillary and terminal peduncled cymes or panicles. Corolla often villous within.

Glabrous or pubescent; flowers sessile or nearly so; nerves of leaves prominent, ..*H. capitellata.*

Scandent or diffuse, quite glabrous, glaucous; flowers pedicelled; calyx-lobes acute, ..*H. scandens.*

Erect, branched, quite glabrous; flowers sessile; calyx-lobes broad and blunt, *H. elegans.*

Subg. 3. *Metabolos*, Bl. Capsule septicidally dehiscent or nearly so, hemispherical and more or less truncate at the apex, often obscurely 2-lobed. Diffuse or half-scandent, rarely erect perennials. Flowers in axillary (very rarely terminal) clusters or cymes.

* *Flowers in axillary peduncled cymes. Prostrate or diffuse perennials.*

× Flowers pedicelled, in loose cymes.

All parts more or less pubescent; calyx-lobes longer than the tube, ...*H. ulmifolia.*

All parts glabrous; calyx-teeth minute, ...*H. glabra.*

× × Flowers sessile or nearly so, in little heads collected into peduncled cymes or clusters.

Flowers minute, pale blue; capsule only about ½ lin. across, ...*H. costata.*

* * *Flowers sessile or very shortly pedicelled, in axillary or terminal clusters or heads.*

Prostrate or diffuse, all parts more or less pubescent; clusters axillary,..*H. auricularia.*

Erect, slightly pubescent; clusters terminal, involucred by the 4 or 5 uppermost leaves, ..*H. scabra.*

1. H. TRINERVIA, Roem. and Schult, Syst. Veg. III. 197; Bedd. Icon. t. 29. (*Oldenlandia trinervia*, Retz. Obs. IV. 23; Miq. Fl. Ind Bat. II. 189).

HAB. Chittagong (Hf. and Th.); Arracan, in grassy spots of the beaches near Akyab.—Fl. Fr. Decb.

2. H. RAMOSISSIMA, Spreng. Pugill. II. 32, non Bl. (*Oldenlandia brachypoda*, DC. Prod. IV. 424; Miq. Fl. Ind. Bat. II. 187; *Oldenlandia diffusa*, Roxb. Fl. Ind. I. 423).

HAB. Not unfrequent along the larger rivers, like Sittang, Irrawadi, etc., also in cultivated lands, from Ava down to Pegu and Martaban.—Fl. Fr. DS.

3. H. BIFLORA, Sm. in Rees Cycl. XVII. 15. (*Oldenlandia biflora*, L. sp. pl.; Roxb. Fl. Ind. I. 423; *Oldenlandia Burmanniana*, R. Br. in Wall. Cat. 868; Miq. Fl. Ind. Bat. II. 189; *Oldenlandia herbacea*, DC. Prod. IV. 425; Bth. Fl. Hongk. 151; *H. diffusa*, Willd. sp. pl. I. 566).

Var. α. GENUINA, flowers by 2—3 on very slender pedicels.

Var. β. UNIFLORA, flowers solitary on a very slender pedicel.

Var. γ. GRAMINICOLA, (*H. graminicola*, Kurz in Trim. Journ. Bot. 1875. 326), leaves narrower and stiffer; flowers solitary on very slender axillary pedicels, or by twos and slenderly peduncled; corolla 2 lin. long or somewhat longer; style exserted.

Var. δ. CORYMBOSA, (*Oldenlandia corymbosa*, L. Herb.; DC. Prod. IV. 426; *Oldenlandia ramosa*, Roxb. Fl. Ind. ed. Wall. II. 445; Wight. Icon. t. 822; DC. Prod. IV. 426), flowers by 2—3 and cymose umbellate by 3—7.

HAB. Common in agrarian lands on river-banks, along road-sides, &c., also in grassy spots in the leaf-shedding forests, all over Burma; var. β.

and δ. in agrarian and dry grass-lands of Ava and Pegu, also Andamans.—Fl. Fr. ∞.

4. H. UMBELLATA, WA. Prod. I. 413. (*Oldenlandia umbellata*, L. sp. pl. 174; Roxb. Corom. Pl. I. t. 3 and Fl. Ind. I. 421; Miq. Fl. Ind. Bat. II. 191).

HAB. Burma, probably Ava (Griff. 2895/2).

5. H. ANGUSTIFOLIA, Cham. and Schlecht. in Linn. 1829. 153; DC. Prod. IV. 419. (*H. pinifolia*, Wall. Cat. 850; Don. Gen. Syst. III. 526).

HAB. Tenasserim, Amherst (Wall. Cat. 850 A).

6. H. LINOIDES, Griff. Not. Dicot. 265. (*H. arguta*, R. Br. in Wall. Cat. 864).

HAB. Tenasserim, Tavoy (Wall.); Mergui, in moist sandy places, near Culweng. (Griff.).—Fl. Octob.

7. H. GRACILIS, Wall. in Roxb. Fl. Ind. I. 377, non DC. (*H stricta*, Wall. in As. Research. XIII. 369, non Sm.; *H. fusca*, Ham. in Don. Prod. Nep. 134; *H. aspera*, Heyne in Roth. Nov. sp. 93, cum syn.; *Kohautiæ* sp. Griff. Not. Dicot. 265. t. 477).

HAB. Ava, Irrawaddi valley at Katha, in savannahs (Griff.).—Fl. May.

8. H. WALLICHII, Kurz in Journ. As. Soc. Beng. 1876. 136.

HAB. Not unfrequent in the eng- and hill-eng-forests from Martaban down to Tenasserim.—Fl. Fr. Octob.

9. H. SPERGULACEA, (*Oldenlandia spergulacea*, DC. Prod. IV. 428; *Oldenlandia ovalifolia*, Miq. Fl. Ind. Bat. II. 192, non DC.; *H. scapigera*, R. Br. in Wall. Cat. 881; *H. nudicaulis*, WA. Prod. I. 416; Bedd. Icon. t. 33).

HAB. Not unfrequent on rocky ground in the leaf-shedding forests, especially in the dry, eng-, and upper mixed ones, from Prome, Pegu, and Martaban down to Upper Tenasserim.—Fl. Fr. Sept.—Decb.

10. H. PANICULATA, (*Oldenlandia paniculata*, L. sp. pl. 1667; Roxb. Fl. Ind. I. 422; Bth. Fl. Hongk. 152; DC. Prod. IV. 427; *H. racemosa*, Lamk. Dict. III. 76 and Ill. t. 62. f. 2; Wight Icon. t. 312; *Oldenlandia alata*, Roxb. Fl. Ind. I. 421, non Kœn.).

HAB. Frequent in rubbishy places, in garden and other cultivated land, along river-banks, &c., all over Burma.—Fl. Fr. Jan.—June.

11. H. ANDAMANICA, Kurz in Journ. As. Soc. Beng. 1872. 311.

HAB. On moist sandstone rocks along choungs in the forests of the Andamans.—Fl. Fr. May, June.

A branched variety of this has the capsules more compressed and more keel-winged and the calyx-teeth still larger. As a species it is allied to *H. lanceæfolia*, Dalz., and *H. alata*, L.

12. H. CAPITELLATA, R.Br. in Wall. Cat. 837; Walp. Rep. II. 494.

Var. *α.* GENUINA, (*Oldenlandia rubioides*, Miq. Fl. Ind. Bat. II. 353), all parts quite glabrous.

Var. *β.* SUBPUBESCENS, stems glabrous, the branchlets and the undersurface of the leaves minutely pubescent.

Var. *γ.* PUBESCENS, all parts densely pubescent, the leaves above roughish minutely, beneath softly and yellowish but shortly, pubescent; calyx-teeth often longer and larger.

HAB. Var. *α.* and *β.* from Martaban down to Tenasserim; also Ava, Kakhyen hills; var. *γ.* not unfrequent in the hill-toungyas, and along choungs in the tropical forests of the Martaban and Tenasserim hills, up to 3000 ft. elevation.—Fl. Decb.—Febr.; Fr. Febr.

This species has been identified with *H. fruticosa* of Linne, but the Ceylon plant of this name is certainly distinct.

13. H. SCANDENS, Roxb. Fl. Ind. I. 364; DC. Prod. IV. 422.

HAB. Chittagong (Hf. and Th.); Ava, Kakhyen hills (J. Anderson).—Fl. Decb.; Fr. Jan.—March.

14. H. ELEGANS, Wall. Cat. 887.

HAB. Not unfrequent in the drier hill-forests, especially the pine-forests, of the Martaban hills east of Toungthoo, at 4000—5000 ft. elevation; also Tenasserim, Tavoy (Wall.; Helf.).

N. B. Bentham (Fl. Hongk. 149) mentions doubtfully *H. loganioides*, Bth., as growing about Moulmein; possibly this species is meant? *H. loganioides*, with long calyx-lobes, occurs on Mt. Ophir near Malacca.

15. H. ULMIFOLIA, Wall. in Roxb. Fl. Ind. ed. Wall. I. 370; DC. Prod. IV. 421; (*H. lineata*, Don. Prod. Fl. Nep. 134).

HAB. In the drier hill-forests, especially in the pine-forests, of the Martaban hills east of Toungthoo, at 4000 to 6000 ft. elevation.—Fr. March.

16. H. GLABRA, Wall. Cat. 848; Miq. Fl. Ind. Bat. II. 133. (*Spermacoce glabra*, Roxb. Fl. Ind. I. 368).

HAB. Tenasserim (Helf. 2885).

17. H. COSTATA, (*Spermacoce costata*, Roxb. Fl. Ind. I. 370; *H. cærulea*, Korth. in Ned. Kruidk. Arch. II. 160, non L. nec. WA.; *H. capituliflora*, Miq. Fl. Ind. Bat. II. 183; *Metabolos cæruleus*, Bl. Bydr. 992; DC. Prod. IV. 435).

HAB. In tropical forests, more especially along choungs and in shrubbery, of the southern parts of the Pegu Yomah above Rangoon; more frequent in Tenasserim.—Fr. Sept.

18. H. AURICULARIA, L. sp. pl. 147; DC. Prod. IV. 420; Bedd. Icon. t. 27. (*H. venosa*, Korth. in Ned. Kruidk. Arch. II. 160; Miq. Fl. Ind. Bat. II. 182; *Metabolos venosus*, Bl. Bydr. 991; *H. iodoneura*, Miq. l. c. 181; *H. lineata*, Roxb. Fl. Ind. I. 369, non Don).

Hab. Ava hills east of Bhamo (J. Anderson).—Fr. Octob.

19. H. scabra, Wall. Cat. 880.

Hab. Not unfrequent in the tropical forests from Martaban down to Upper Tenasserim.—Fl. Fr. April; Aug.

Doubtful Species.

1. *H. argentea*, Wall. Cat. 858; Walp. Rep. II. 502.

Hab. Ava, banks of the Irrawadi.

2. *H. Merguensis*, Hf. in Bth. and Hf. Gen. Pl. II. 57.

Hab. Tenasserim, Mergui (Griff.).

Scleromitrion, WA.

Conspectus of Species.

Subg. 1. *Eu-Scleromitrion.* (*Fergusonia*, Hf.?) Capsule loculicidally separating into 2 many-seeded cocci. Calyx more or less obovoid, crowned by the converging calyx-limb. Stigmatic lobes 2. Diffuse perennials.

* *Flowers in terminal sessile heads or clusters.*

Flower-heads half-included in the embracing bases of the involucre-like uppermost leaves; calyx-teeth large, ... *S. coronarium.*

* * *Flowers in axillary clusters or heads.*

× All parts glabrous or nearly so.

Leaves linear, not nerved, quite glabrous; flowers in dense clusters; calyx-tube glabrous or nearly so; capsule glabrous or shortly hispid, ... *S. rigidum.*

Leaves ovate to ovate-oblong; flowers by 2—3 or few in the leaf-axils; capsule glabrous, ... *S. nitidum.*

× × All parts, more especially the stems and capsule, more or less shortly hispid.

All parts, also the leaves, shortly scabrous-pubescent; capsule ovoid, about a line long or longer, .. *S. hispidum.*

Stem shortly hispid; leaves glabrous above, minutely puberulous beneath; corolla half the size, pubescent at the throat; capsule globular (like in *Oldenlandia*), with short calyx-lobes, ... *S. paradoxum.*

Subg. 2. *Tetragyneia*, Miq. (*Allœophania*, Thw.). Capsule separating into 2 cocci which again separate into twos. Stigmas or stigmatic lobes 4.

Stigmas capitate; leaves not rugose, sparingly hirsute above, ... *S. decipiens.*

Stigmas linear, almost spreading; leaves rugose, above glabrous or nearly so, *S. rugosum.*

1. S. coronarium, (*Hedyotis coronaria*, Wall. Cat. 856).

Hab. Tenasserim, Attaran (Brandis); Tavoy (Wall.)—Fl. Oct.

2. S. tetrandrum, (*Rondeletia tetrandra*, Roxb. Fl. Ind. I. 524; *Hedyotis macrophylla*, Wall. Cat. 841; Miq. l. c. 178; *Hedyotis nodiflora*, Wall. Cat. 855; Don. Gen. Syst. III. 526).

Hab. All over Tenasserim.—Fr. Febr.

3. S. rigidum, (*Hedyotis rigida*, Miq. Fl. Ind. Bat. II. 181; *Metabolos rigidus*, Bl. Bydr. 992).

Hab. Tenasserim.—Fr. Febr.

सन्दर्भ ग्रन्थ
REFRENCE BOOK

4. S. NITIDUM, (*Hedyotis nitida*, WA. Prod. I. 412).

HAB. Not unfrequent in the eng-forests of Pegu and in those of Martaban east of Tounghoo.—Fr. CS.

Very probably only an extreme, broad-leaved form of *S. hispidum*, while *S. approximatum* (*Hedyotis approximate*, WA.; *Spermacoce tubularis*, R. Br. ?) may be an extreme, narrow-leaved variety of it.

5. S. HISPIDUM, (*Hedyotis hispida*, Retz. Obs. Bot. IV. 23; Roxb. Fl. Ind I. 364; DC. Prod. IV. 420; *Hedyotis* sp. Griff. Not. Dicot. 265; *Spermacoce* sp. Griff. l. c. 272).

HAB. Frequent along choungs in the moister upper mixed and the tropical forests, from Ava and Martaban to Pegu.—Fr. Jan.

6. S. PARADOXUM, (*Hedyotis paradoxa*, Kurz in Journ. As. Soc. Beng. 1876. 135).

HAB. Common in the moister upper mixed forests of the Andamans. —Fl. Fr. Jan.—March.

NB. *Allæophania decipiens*, Thw., is in my eyes a very near ally to *Scleromitrium rugosum* (*Hedyotis rugosa*, Korth.).

Spermacoce, L.

Conspectus of Species.

Flowers in dense whorl-like clusters or heads, white, about a line long; capsules 1 lin. long, ... *S. stricta.*

Flowers 2—3 lin. long, blue, few- clustered; capsule about 2 lin, long, ... *S. hispida.*

1. S. STRICTA, L. f. Suppl. 120; Roxb. Fl. Ind. ed. Wall. I. 376; DC. Prod. IV. 554; Miq. Fl. Ind. Bat. II. 331; Bth. Fl. Hongk. 162.

HAB. Frequent in the dry and open forests all over Ava and Pegu down to Upper Tenasserim.—Fl. RS.; Fr. CS.

2. S. HISPIDA, L. Mant. 558; Roxb. Fl. Ind. ed. Wall. II. 379; WA. Prod. I. 438; Miq. Fl. Ind. Bat. II. 332. (*S. scabra*, Willd. sp. pl. I. 572; Roxb. Fl. Ind. l. c. 377).

Var. α. HISPIDA, whole plant hispid-pubescent, the leaves usually of a softer texture and undulate; corolla-tube only 1½-2 lin. long; capsule greyish or whitish villous; seeds opaque, black.

? Var. β. ARTICULARIS, (*S. articularis*, L. f. Suppl. 119; Roxb. l. c. 378; Miq. l. c. 332; *S. Avana*, R. Br. in Wall. Cat. 828; G. Don. Gen. Syst. III. 621; *S. longicaulis*, R. Br. in Wall. Cat. 826; G. Don. Gen. Syst. III. 621), whole plant more scabrous, and short pubescent, the leaves rigid and not undulate; corolla-tube about 3 lin. long, slender; capsule shorter and hispid; seeds often glossy, black or brownish.

HAB. Var. β. only, frequent in agrarian land and on stony sterile grounds in the leaf-shedding forests, from Ava and Martaban down to Tenasserim, up to 1500 ft. elevation.—Fl. Fr. D. S.

सन्दर्भ ग्रन्थ
REFRENCE BOOK

Knoxia, L.

Conspectus of Species.

* *Stem leafy, without radical leaves, more or less branched.*

Leaves petioled; flowers spiked, forming corymbs, ... *K. corymbosa.*

Leaves sessile or nearly so; flowers corymbose, forming corymbs, ... *K. microcarpa.*

* * *Leaves all crowded at the base; stem scape-like, with narrow small cauline leaves only.*

More or less hairy while young; calyx-tube densely villous; corolla nearly ½ an inch long, ... *K. plantaginea.*

1. K. CORYMBOSA, Willd. sp. pl. I. 582; WA. Prod. I. 439; Wight Illust. t. 128; Miq. Fl. Ind. Bat. II. 330. (*Spermacoce teres*, Roxb. Fl. Ind. ed. Wall. I. 373; *Spermacoce Sumatrensis*, Retz. Obs. IV. 23, non Roxb.).

HAB. Not unfrequent in the dry and eng-forests of Ava, and Prome, and also in Martaban east of Tounghoo.—Fl. March, April.

2 K. MICROCARPA, Kurz MS.

HAB. Not unfrequent in the eng and low forests of Pegu, especially the Irrawaddi zone; also in Martaban, as Yoonzeleen (Brandis); Zwa-Kabin (Parish).—Fl. Octob., Nov.; Fr. Dec., Jan.

There are specimens with a short wide corolla-tube and others with a slender tube nearly twice the length.

3. K. PLANTAGINEA, Wall. Pl. As. Rar. I. t. 32; Miq. Fl. Ind. Bat. II. 330.

HAB. In the dry and eng-forests of Prome as far south as Myodweng, but everywhere rare and sporadic.—Fl. Sept., Octob.; Fr. Octob.—Jan.

Cephalanthus, L.

1. C. NAUCLEOIDES, DC. Prod. IV. 539.—(*Nauclea tetrandra*, Roxb. Fl. Ind. ed. Wall. II. 125).

HAB. Burma, probably Ava hills (Griff.).

Pæderia, L.

Conspectus of Species.

* *Ripe seeds not winged. Capsule globular.*

Glabrous or pubescent; corolla scurfy-tomentose or velvety outside, ... *P. tomentosa.*

* * *Ripe seeds broadly winged. Capsule more or less compressed.*

× Corolla mealy or scurfy-tomentose or velvety outside.

Quite glabrous; calyx-lobes shorter than the calyx-tube; seed-wings pale-coloured, .. *P. foetida.*

Sparingly and shortly puberulous; calyx-lobes longer than the tube; seed-wings blackish, ... *P. calycina.*

× × Corolla not tomentose, but only sparingly and shortly pilose.

All softer parts, and more especially the undersurface of the leaves, villous-tomentose; seed-wings corky, pale-coloured, ... *P. lanuginosa.*

1. P. TOMENTOSA, Bl. Bydr. 968; Miq. Fl. Ind. Bat. II. 258, and Ann. Mus. Lugd. Bat. IV. 254. (*P. barbulata*, Miq. in Ann. Mus. L. B. IV. 255; *P. densiflora*, Miq. Fl. Ind. Bat. II. 259; *P. foetida*, Bth. Fl. Hongk. 162?).

Var. α. TOMENTOSA, all parts more or less shortly pubescent or almost scurfy-pubescent.

Var. β. GLABRA, all parts glabrous or only sparingly and minutely pubescent on the nerves.

HAB. Arracan hills.—Fl. Fr. Octob.

2. P. FŒTIDA, L. Mant. 52; Roxb. Fl. Ind. ed. Wall. II. 517; WA. Prod. I. 424; Miq. Fl. Ind. Bat. II. 258. (*P. ovata*, Miq. in Ann. Mus. Lugd. Bat. IV. 255).

Var. β. MICROCARPA, capsule compressed ovoid-orbicular, only about 3 lin. long.

HAB. Not unfrequent in shrubbery, from Chittagong and Ava down to Upper Tenasserim; Var. β. on Taong dong in Ava (Wall.)—Fr. Nov.—Jan.

3. P. CALYCINA, Kurz in Journ. As. Soc. Beng. 1873. 74.

HAB. Tenasserim, Tavoy (Wall. Cat. 6247. E).—Fr. Nov.

4. P. LANUGINOSA, Wall. Pl. As. rar. II. 52. t. 165; Miq. Fl. Ind. Bat. II. 259. (*P. macrocarpa*, Wall. Cat. 7292; Don Gen. Syst. IV. 561).

HAB. Frequent in the mixed forests, especially along choungs, all over Burma from Ava and Martaban down to Tenasserim; also freely springing up in the upper toungyas.—Fl. Jan.—July; Fr. Jan.—March.

Lasianthus, Jack.

Conspectus of Species.

* *Flowers in clusters or short peduncled cymes, the bracts very minute and usually deciduous.*

Flowers sessile; calyx glabrous, the lobes about as long as the tube; drupes crowded by the linear-lanceolate calyx-teeth, ... *L. lucidus.*

Flowers very shortly pedicelled or almost sessile; calyx puberulous, the limb broad with very short teeth; drupes crowned with the cyathiform contracted almost truncate calyx-limb, ... *L. constrictus.*

* * *Flowers in densely bracted sessile clusters, the bracts more or less conspicuous and often persistent.*

× Calyx-segments about a line long or shorter. Stipules small.

Leaves shortly petioled, puberulous beneath; outer bracts broad and blunt, but short; calyx-lobes lanceolate, ... *L. stercorarius.*

Sparingly stiff-hairy; leaves almost sessile, oblique; bracts all linear-subulate, hirsute, ... *L. Wallichii.*

× × Calyx-segments linear to linear-subulate, 3—5 lin. long, hirsute.

+ Stipules very large and leafy, oval.

Leaves glabrous or nearly so; stipules persistent, involucrating the flower heads, ..*L. stipularis.*

+ + Stipules more or less lanceolate, small, not leafy.

All parts brown-hirsute; outer bracts very large, leafy, ovate, acuminate, *L. cyanocarpa.*

1. L. LUCIDUS, Bl. Bydr. 997; Miq. Fl. Ind. Bat. II. 319.

HAB. Upper Tenasserim (Falconer).—Fl. Febr.

2. L. CONSTRICTUS, Wight in Maclell. Calc. Journ. VI. 515; Walp. Ann. II. 762. (*L. pauciflora*, Wight l. c. ? ; *Mephitidea* sp. Griff. Not. Dicot. 267. t. 474. f. 4).

HAB. Common in the tropical forests of the Andamans; Tenasserim, from Thoungyeen (Brandis) to Mergui (Griff.).—Fl. Fr. April—June.

Habit of *L. stercorarius*, but differs in the inflorescence and in the shape of the calyx-limb.

3. L. STERCORARIUS, Bl. Bydr. 1000; Miq. Fl. Ind. Bat. II. 324 and Annal. Mus. Lugd. Bat. IV. 248.

HAB. Frequent in the tropical forests of Upper Tenasserim and the Andamans.—Fl. March, April.

4. L. WALLICHII, Wight in Maclell. Calc. Journ. VI. 503. (*Mephitidea Wallichii*, WA. Prod. I. 390; Walp. Ann. II. 760; *Nonatelia? hispida*, Wall. in Roxb. Fl. Ind. II. 187).

HAB. Not unfrequent in the tropical forests of Martaban and Upper Tenasserim; also on the Andamans.—Fl. April, May; Fr. March.

5. L. STIPULARIS, Bl. Bydr. 997; Miq. Fl. Ind. Bat. II. 319 and Ann. Mus. Lugd. Bat. IV. 246.

HAB. Tenasserim (or Andamans) (Helf. 2937).

6. L. CYANOCARPUS, Jack in Linn. Trans. XIV. 125; Miq. Fl. Ind. Bat. II. 316, non Bl.—(*L. bracteatus*, Wight in Maclell. Calc. Journ. VI. 501; *Triosteum hirsutum*, Roxb. Fl. Ind. ed. Wall. II. 180; *L. Roxburghii*, Wight l. c. 502).

HAB. Chittagong (Roxb.); rather frequent in the tropical forests of South Andaman.—Fl. May, June.

Cephaëlis, L.

1. C. HERBACEA, Roxb. Fl. Ind. I. 533. (*Psychotria herbacea*, L. sp. pl. 245; *Geophila reniformis*, Don. Prod. Nep. 136; Wight Icon. t. 54; Miq. Fl. Ind. Bat. II. 311).

HAB. Rather frequent in tropical forests, especially in the shade of bamboo, from Martaban and the southern spurs of the Pegu Yomah down to Tenasserim and the Andamans.—Fl. June, July; F. Oct.—Dec.

Hydnophytum, Jack.

1. H. FORMICARUM, Jack in Linn. Trans. XIV. 124; Miq. Fl. Ind. Bat. II. 309.

HAB. Frequent on trees in the mangrove swamps of the Andamans. —Fl. Fr. May, June.

Psychotria, L.

Conspectus of Species.

Subg. 1. *Leucopyrenos.* Seeds plano-convex without ribs or dorsal keel, enclosed in a white thin membranous pyrene.

Small decumbent under-shrub, the stems and often also the nerves beneath shortly tomentose, ... *P. calocarpa.*

Subg. 2. *Eu-Psychotria.* Pyrenes hard, with a more or less distinct dorsal rib, or ribbed and furrowed.

* *Pyrenes not ribbed and furrowed, but dorsally more or less distinctly keeled or trigonous.*

× Pyrenes plane-convex, with an obsolete longitudinal dorsal rib. Albumen spuriously ruminate.

Glabrous; panicles elongate and raceme-like, ... *P. connata.*

As preceding; leaves larger; panicle thyrsoid or corymb-like; berries obovoid, .. *P. platyneura.*

× × Pyrenes 3-gonous, the inner face flat, the 2 lateral ones more or less concave and meeting in a longitudinal ridge.

+ Quite glabrous.

Habit of *P. connata;* cymes small, in slightly puberulous peduncled panicles; calyx about a lin. across, obsoletely 5-toothed; albumen equable, ... *P. symplocifolia.*

+ + Tawny or rusty hairy. Flowers sessile, clustered or in heads.

Flower-heads very small; leaves glabrous above, ... *P. polyneura.*

Flower-heads rather large, compact; leaves hirsute on both sides; albumen equable, .. *P. Helferiana.*

* * *Pyrenes longitudinally ribbed and furrowed (ribs usually 3—5.)*

× Flowers clustered or in heads.

Leaves opaque; cyme compact, somewhat tomentose; bracts subulate; albumen ruminate, ... *P. monticola.*

Leaves glossy; panicle thyrsoid, glabrous, the branchings whorled; bracts broadly ovate, ... *P. adenophylla.*

× × Flowers pedicelled, in lax cymes or corymbs.

+ Small erect shrubs.

× Leaves thick membranous or pergamentaceous, turning more or less brownish in drying.

† Drupe 4—5 lin. long.

Glabrous; cymes rusty-puberulous; albumen ruminate, ... *P. viridiflora.*

† † Drupe only 2—3 lin. long. Albumen ruminate.

Cymes rusty puberulous on a peduncle 1—½ in. long; calyx-teeth distinct, linear; berries crowned by the calyx-lobes, ... *P. Asiatica.*

Cymes rusty puberulous, almost sessile; calyx almost truncate; berries truncate-crowned, ... *P. Andamanica.*

Cymes glabrous; leaves narrower, ... *P. divergens.*

× × Leaves thin membranous, remaining green in drying.

All parts glabrous, ... *P. viridissima.*

+ + Large scandent shrubs. Albumen equable.

Corymbs furnished at the lower branchings with 2 opposite narrow floral leaves, .. *P. sarmentosa.*

1. P. CALOCARPA, Kurz in Journ. As. Soc. Beng. 1872. 315.

HAB. Frequent in the tropical forests of Pegu and Martaban down to Upper Tenasserim; Ava, Kakhyen hills (J. Anderson).—Fl. Aug.—Febr. Fr. Jan.—March.

2. P. CONNATA, Wall. in Roxb. Fl. Ind. II. 163; WA. Prod. I. 433. (*Grumilea elongata*, Wight Icon. t. 1036; *Pæderia erecta*, Roxb. Fl. Ind. I. 685).

HAB. Frequent in the moister upper mixed and in the tropical forests of the Pegu Yomah and Tenasserim down to the Andamans.—Fl. April, May; Fr. CS.

3. P. PLATYNEURA, Kurz in Trim. Journ. Bot. 1875. 327.

HAB. Frequent in the tropical forests of the Andaman islands.—Fl. May, June.

Much resembling *P. robusta*, Bl., from which it differs in the stipules, glabrous inflorescence, and glabrous corolla.

4. P. SYMPLOCIFOLIA, Kurz For. Fl. II. 11.

HAB. In the drier hill-forests of the Martaban hills east of Tounghoo, not rare at 5000 to 7000 ft. elevation.—Fl. Fr. March.

5. P. POLYNEURA, Kurz in Trim. Journ. Bot. 1875. 327.

HAB. Not unfrequent in the tropical forests of the South Andaman. —Fl. May.

6. P. HELFERIANA, Kurz in Journ. As. Soc. Beng. 1872. 314.

HAB. Tenasserim—or Andamans?—(Helf. 3038).

7. P. MONTICOLA, Kurz in Journ. As. Soc. Beng. 1872. 315.

HAB. Frequent in the moister hill-forests of Martaban and Upper Tenasserim, at 3500 to 6000 ft. elevation.—Fl. Fr. March, April.

8. P. ADENOPHYLLA, Wall. in Roxb. Fl. Ind. II. 166.

HAB. Tenasserim—or Andamans?—(Helf. 3037).

Wallich describes his plant as having racemes of the thickness of the little finger; my plant agrees with his herbarium-specimens and belongs in the vicinity of *Grumilea Gardneri*, Thw., a very near ally to *Psych. leucocoma*, Teysm. and Binn. in Tydsch. Nat. Ver. Ned. Ind.

9. P. VIRIDIFLORA, Reinw. ap. Bl. Bydr. 963; DC. Prod. IV. 521; Miq. Ann. Mus. Lugd. Bat. IV. 207. (*Grumilea viridiflora*, Miq. Fl. Ind. Bat. II. 298).

Var. α. GENUINA, stipules broad and rather large; leaves entire; cymes puberulous; calyx-teeth inconspicuous.

Var. β. UNDULATA, as preceding, but leaves undulate, the calyx-teeth about ½ lin. long.

? Var. γ. CALOPHYLLA, (*P. calophylla*, Wall. and Griff. MS.), stipules small and subulate ; cymes glabrous ; calyx-teeth about ½ lin. long.

HAB. Var. β. Chittagong (Hf. and Th.).

P. picta, Wall. Cat. 8353. B. from Tavoy, Tenasserim, seems to belong to var. γ., but the specimens are too imperfect for identification.

10. P. ANDAMANICA, Kurz in Trim. Journ. Bot. 1875. 328.

HAB. Frequent in the tropical forests of the Andamans.—Fl. Fr. April, May.

11. P. DIVERGENS, Bl. Bydr. 959 ; DC. Prod. IV. 320 ; Miq. Ann. Mus. Lugd. Bat. IV. 206. (*Grumilea divergens*, Miq. Fl. Ind. Bat. II. 299).

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim, very rare in those of the eastern slopes of the Pegu Yomah.—Fl. May—June ; Fr. Febr., March.

This may possibly be a form only of *P. Asiatica*.

12. P. VIRIDISSIMA, Kurz in Journ. As. Soc. Beng. 1872. 315.

HAB. Rather rare in the tropical forests of Martaban east of Tounghoo and in Tenasserim (Helf. 3048).

13. P. SARMENTOSA, Bl. Bydr. 964 ; DC. Prod. IV. 522 ; Miq. Fl. Ind. Bat. II. 286 and Ann. Mus. Lugd. Bat. IV. 206 ; Wight Icon. t. 1038.

HAB. Tenasserim, Amherst (Falconer).—Fl. April.

Chasalia, Comm.

1. CH. CURVIFLORA, Thw. Ceyl. Pl. 150 ; Miq. Ann. Mus. Lugd. Bat. IV. 202.—(*Psychotria curviflora*, Wall. in Roxb. Fl. Ind. II. 167 ; *Psychotria ophioxyloides*, Wall. l. c. 168 ; *Ch. lurida*, Miq. Fl. Ind. Bat. II. 282 ? ; *Psychotria ambigua*, WA. ; Wight Illustr. II. t. 127).

HAB. Not unfrequent in the tropical forests from Martaban down to Tenasserim and the Andamans.—Fl. April, May.

Saprosma, Bl.

Conspectus of Species.

* *Flowers sessile, terminal.*

Flowers solitary ; stipules cut and fringed, ... *S. consimile.*

* * *Flowers solitary or by 3 or more in peduncled, axillary cymes.*

Cymes poor-flowered, long-peduncled, glabrous, axillary by 2—4 ; upper leaves usually ternary ; corolla 4-merous, ... *S. ternatum.*

1. S. CONSIMILE, Kurz For. Fl. Burm. II. 29.

HAB. Not unfrequent in the drier hill-forests, at 3000 to 5000 ft. elevation ; from the Martaban hills to Tenasserim.—Fr. Febr.

Much resembles *S. fruticosum*, Bl., but differs in the flowers and stipules.

2. S. TERNATUM, Bth. and Hf. Gen. Pl. II. 131, (*Serissa ternata*, Kurz in And. Rep. ed. 2. 40; *Pæderia ternata*, Wall. Cat. 6248; Don Gen. Syst. III 561).

Var. α. GENUINA, all parts quite glabrous.

? Var. β. PUBERULA, stipules, petioles, and nerves beneath more or less pubescent.

HAB. Var. β. rather frequent in the tropical forests of the Andamans —Fl. May, June.

Coffea, L.

Conspectus of Species.

* *Corolla funnel-shaped.*

All parts quite glabrous and glossy; flowers very shortly pedicelled, in axillary clusters, ... *C. Arabica.*

* * *Corolla salver-shaped.*

× Berries peduncled.

All parts quite glabrous and glossy; flowers on pedicels, ½—1 in. long usually terminal, rarely axillary, ... *C. tetrandra.*

× × Berries sessile.

Young shoots and nerves beneath sparingly pubescent; flowers sessile, terminal and axillary, ... *C. Benghalensis.*

*1. C. ARABICA, L. sp. pl. 245; Roxb. Fl. Ind. ed. Wall. II. 193; Sims. Bot. Mag. t. 1303; Wight Icon. t. 53; Miq. Fl. Ind. Bat. II. 305.

HAB. Occasionally cultivated, but nowhere on a large scale.—Fl. March—May; Fr. Nov.—Jan.

2. C. TETRANDRA, Roxb. Fl. Ind. ed. Wall. II. 193; DC. Prod. IV. 499. (*Prismatomeris tetrandra*, Hf. in Bth. and Hf. Gen. pl. II. 119).

HAB. Not unfrequent in the tropical forests of the Martaban hills and the Andamans, up to 3000 ft. elevation; also Chittagong.—Fl. March, April.

3. C. BENGALENSIS, Roxb. Fl. Ind. ed. Wall. II. 194; DC. Prod. IV. 499; WA. Prod. I. 435; Bot. Mag. t. 4917.

HAB. Tropical forests of Martaban and Tenasserim; also Chittagong.

Ixora, L.

Conspectus of Species.

Subg. 1. *Pavetta*, L. Flowers 4- or 5-merous. Style exserted to the same or nearly the same length of the tube, the stigma simple and spindle-like.

O Corolla more funnel-shaped, the tube only 3 lin. long.

+ Flowers sessile or nearly so, in a dense head.

Glabrous, turning black in drying; habit of *I. Pavetta.* .... *I. compactiflora.*

+ + Flowers in cymes or corymbs, shortly pedicelled.

Glabrous, the corymbs puberulous and recurved; berries crowned by the calyx-lobes, .. *I. recurva.*

Glabrous, also the erect or nearly erect corymbs; berries marked by the circular scar of the fallen calyx-limb, ... *I. weberæfolia.*

O O Corolla-tube slender, ½—¾ in. long; flowers pedicelled.

All parts (also the corymbs) glabrous, in drying remaining green, ... *I. Pavetta.*

All parts more or less puberulous to tomentose, usually turning black in drying; corymbs short-puberulous, ... *I. tomentosa.*

All parts villous-pubescent, in drying not blackening; corymbs villous from spreading short hairs, ... *I. naucleiflora.*

Subg. 2. *Ixora.* L. Flowers 4- rarely 5-merous. Style shorter or longer exserted but never exceeding the corolla-tube by more than ½—⅔ of its length, the stigmatic lobes usually spreading, rarely longer cohering.

§. *Eu-Ixora.* Flowers 4-merous.

* *Flowers in sessile or peduncled cymes or corymbs.*

× Corymbs trichotomous, short-peduncled or sessile and in this case consisting of 3 or more terminal peduncled cymes. Flowers and fruits conspicuously (1—2 lin.) pedicelled as in true *Pavetta.*

+ Leaves acuminate or acute at the base, on a petiole ½—1 in. long.

Leaves one-coloured, black in drying; flowers white; corolla-tube 4 lin. only long, .. *I. coriacea.*

Exactly as preceding, but corolla-tube nearly an inch long, ... *I. macrosiphon.*

Leaves pale-coloured beneath; flowers pale-rose; corolla-tube an inch long, *I. rosella.*

+ + Leaves sessile or nearly so, the base rounded or cordate.

Tree; corymbs on a peduncle 1—1½ in. long, ... *I. brunnescens.*

× × Cymes or corymbs short-peduncled or sessile, the flowers sessile or shortly and stoutly pedicelled.

+ Flowers white or rarely pale rose-coloured (never orange or scarlet), the corolla-lobes often comparatively narrower.

O Corolla puberulous or pubescent outside.

All parts more or less pubescent; cyme rather small, almost sessile; leaves pubescent, sessile, ... *I. Brunonis.*

O O Corolla glabrous, rarely the throat bearded.

† Flowers sessile. Corolla-tube ½—⅔ in. long, the throat naked.

Shrub; leaves sessile with a rounded or cordate base; corymb glabrous, .. *I. memecylifolia.*

Shrub; leaves petioled, the base acute or obtuse; corymb glabrous, ... *I. sessiliflora.*

Tree; leaves petioled, the base acute or obtuse; cymes puberulous, ... *I. rugosula.*

† † Flowers shortly pedicelled. Corolla-tube 1½—2 in. long, the throat bearded.

Glabrous, also the inflorescence; leaves sessile or nearly so, ... *I. Brandisiana.*

+ + Flowers orange to deep scarlet, very rarely (in varieties chiefly) white or pale rose-coloured, and in this case the corolla-lobes always much broader than those of the white-flowered section.

O Calyx-teeth very short.

† Inflorescence puberulous.

Glabrous; calyx-teeth acute; corolla-lobes more or less acute, ... *I. coccinea.*

† † Inflorescence glabrous.

Glabrous; calyx-teeth blunt; corolla-tube 1—1¼ in. long, the lobes almost orbicular, .. *I. stricta.*

Glabrous; 2 of the calyx-teeth acute, the 2 others blunt; corolla-lobes acute or almost acuminate, ... *I. glaucina.*

O O Calyx-teeth 1—1½ lin. long.

Glabrous; calyx-lobes erect; flowers white, ... *I. Korthalsiana.*

* * *Corymbs panicled, the panicles thyrsoid, brachiate-trichotomous, longer or shorter peduncled.*

× Panicle thyrsoid, long-peduncled, furnished at the base or above the base of the peduncle with a pair of sessile cordate or oval floral leaves.

† Corolla-throat naked, the tube 5—6 lin. long.

Leaves thin, turning black in drying; panicle glabrous; pedicels 1—2 lin. long, .. *I. nigricans.*

Leaves membranous or chartaceous, one-coloured; pedicels 1—2 lin. long; panicle glabrous, ... *I. diversifolia.*

Leaves coriaceous, pale-coloured beneath; flowers sessile; panicle puberulous, .. *I. spectabilis.*

+ + Corolla-throat bearded.

Glabrous; corolla-tube an inch long, ... *I. barbata.*

× × Panicle longer or shorter peduncled, without floral leaves.

+ Style hairy. Panicle minutely puberulous.

Tree; all parts glabrous; flowers sessile, the corolla-tube only 2—2½ lin. long, .. *I. parviflora.*

+ + Style glabrous. Panicle pubescent.

Shrub; leaves puberulous beneath; corolla-tube 1—1¼ in. long, ... *I. villosa.*

Shrub; leaves and branchlets glabrous; corolla-tube ½ in. long, ... *I. cuneifolia.*

§ § *Pentadium*, DC. Flowers 5-merous. Panicle long-peduncled.

Leaves glabrous, membranous, ... *I. Helferi.*

Leaves almost coriaceous, more or less shortly pubescent beneath, ... *I. longifolia.*

1. I. COMPACTIFLORA, Kurz in Journ. As. Soc. Beng. 1872. 315.

HAB. Upper Tenasserim, Daunat-pass on the Thounggyeen side, at 2000 ft. elevation (Dr. Brandis).—Fl. April.

Allied to *Ixora* (*Pavetta*) *involucrata*, Thw., from Ceylon.

2. I. RECURVA, (*Pæderia recurva*, Roxb. Fl. Ind. ed. Wall. II. 518; DC. Prod. IV. 471).

HAB. Chittagong, in moist situations amongst the hills (Roxb.).—Fl. HS.; Fr. Oct., Nov.

3. I. WEBERÆFOLIA, (*Pavetta weberæfolia*, Wall. Cat. 6182; Don Gen. Syst. III. 575; *Pavetta cerberæfolia*, Miq. Fl. Ind. Bat. II. 279).

HAB. Common in the coast-forests of the Andamans; Ava, Segain (Wall. Cat. 72[illegible]).—Fl. Fr. ∞.

Very near to the preceding species, and some of Wallich's specimens indeed really seem to be referable to Roxburgh's *Pæderia recurva.*

4. I. PAVETTA, Roxb. Fl. Ind. ed. Wall. I. 395; Bth. Fl. Austr.

III. 414. (*Pavetta Indica*, L. sp. pl. 160; WA. Prod. I. 431; Wight Icon. t. 148).

HAB. Not unfrequent in the coast-forests of the Andamans.—Fl. May, June.

5. I. TOMENTOSA, Roxb. Fl. Ind. ed. Wall. I. 296; Bth. Fl. Austr. III. 414. (*Pavetta tomentosa*, Sm. in Rees Cycl.; WA. Prod. I. 431; Wight Icon. t. 186; *Pavetta subvelutina*, Miq. Fl. Ind. Bat. II. 276; *Pavetta Indica*, Miq. l. c. 275, an Linné ?; *Pavetta Rothiana*, DC. Prod. IV. 491; Miq. in Ann. Mus. Lugd. Bat. IV. 195; *Pavetta montana*, Rwdt. in Bl. Bydr. 952; Miq. Ann. Mus. Lugd. Bat. IV. 195).

Var. *α.* ROXBURGHII, leaves, &c., more or less pubescent, especially beneath.

Var. *β.* GLABRESCENS, leaves of a thinner texture, only sparingly and minutely puberulous, especially beneath, or quite glabrescent.

HAB. Common in all leaf-shedding forests, all over Burma, from Ava and Martaban down to Tenasserim; var. *α.* more on permeable substrata and on alluvium.—Fl. June, July; Fr. CS.

N. B. *Pavetta Brunonis*, Wall. ap. Wight Icon. t. 1065, seems to be that tomentose harsh-leaved form of the above species which is also frequent on calcareous substrata in Ava. Miquel, in his Fl. Ind. Bat., confounds *Pavetta Brunonis*, Wall. Cat. 6172, and *Ixora Brunonis*, Wall. Cat. 6163, two perfectly different species.

6. I. NAUCLEIFLORA, (*Pavetta naucleiflora*, Wall. Cat. 6171; Don. Gen. Syst. III. 575; Miq. Fl. Ind. Bat. II. 278).

HAB. Tenasserim, Moulmein hills (Falconer).—Fl. Febr.

7. I. MACROSIPHON, Kurz in Trim. Journ. Bot. 1875. 327.

HAB. Not unfrequent in the tropical and beach-forests of the Andaman islands.—Fl. May.

8. I. ROSELLA, Kurz in Journ. As. Soc. Beng. 1872. 317.

HAB. Frequent in the tropical forests of the Andaman islands.—Fl. May, June.

9. I. BRUNNESCENS, Kurz in Journ. As. Soc. Beng. 1872. 317.

HAB. Frequent in the coast, more especially the beach-forests of the Andaman islands.—Fr. April.

10. I. BRUNONIS, Wall. Cat. 6136; Don. Gen. Syst. III. 375.

HAB. Locally in the tropical forests of the eastern slopes of the Pegu Yomah, especially on the head-waters of the Khaboung stream.—Fl. April, May.

11. I. MEMECYLIFOLIA, Kurz in Journ. As. Soc. Beng. 1872. 316.

HAB. Upper Tenasserim, Houndrow (Dr. Brandis).—Fl. April.

The inflorescence and flowers are suspiciously like those of *I. sessiliflora*, Kz., and, despite the very different looking leaves, may only be a variety of it.

12. I. SESSILIFLORA, Kurz in Journ. As. Soc. Beng. 1872. 316.

HAB. Not unfrequent in the drier hill-forests of Martaban east of Tounghoo, at 3000 to 4000 ft. elevation.—Fl. April.

Very near to *I. subsessilis*, Wall., but differs in the sessile flowers, calyx, &c.

13. I. RUGOSULA, Wall. Cat. 6158; Kurz For. Fl. Burm. II. 25.

HAB. Rare along choungs in the tropical forests of the central parts of the Pegu Yomah; Upper Tenasserim, hot springs of the Attaran river (Wall.).—Fl. May; Fr. Febr.

14. I. BRANDISIANA, Kurz in Journ. As. Soc. Beng. 1872. 316.

HAB. Upper Tenasserim, Attaran (Dr. Brandis).—Fl. July.

*15. I. COCCINEA, L. sp. pl. 159; Roxb. Fl. Ind. ed. Wall. I. 385; WA. Prod. I. 427; Wight Icon. t. 153; Miq. Fl. Ind. Bat. II. 266. (*I. grandiflora*, R. Br. in Bot. Reg. t. 152; *I. propinqua*, R. Br. in Wall. Cat. 6119; Don. Gen. Syst. III. 570).

Var. *α.* LINNEANA, corolla-lobes ovate-lanceolate, very acute.

Var. *β.* BANDHUCA, (*I. Bandhuca*, Roxb. Fl. Ind ed. Wall. I. 386; Bot. Reg. t. 513; Wight Icon. t. 149; Miq. Fl. Ind. Bat. II. 266), corolla-lobes broadly ovate, bluntish; leaves usually all sessile, with a cordate base, blunt, mucronate.

HAB. Generally planted all over the country, but nowhere wild.—Fl. March.

16. I. STRICTA, Roxb. Fl. Ind. I. 384; DC. Prod. IV. 486; Wight Icon. t. 1307.—(*Pavetta stricta*, Miq. Fl. Ind. Bat. II. 269; *I. coccinea*, Curt. Bot. Mag. t. 169; *I. alba*, Roxb. Fl. Ind. ed. Wall. I. 389; Wight Icon. t. 707; *I. blanda*, Ker. Bot. Reg. t. 100).

Var. *α.* ROXBURGHIANA, corymbs sessile or nearly so, rarely shortly peduncled; leaves usually almost sessile and often rounded at the base.

Var. *β.* BLUMEANA, (*Pavetta Javanica*, Bl. Bydr. 949; Miq. Fl. Ind. Bat. II. 268 and Ann. Mus. Lugd. Bat. IV. 191; *I. amœna*, Wall. Cat. 6121; Miq. Fl. Ind. Bat. II. 267), corymbs more lax, on a 1—1½ in. long peduncle; leaves usually acute at the base; petiole 1—2 lin. long; flowers somewhat larger.

HAB. Both varieties in Upper Tenasserim, Moulmein, also in tropical forests above Rangoon in Pegu.—Fl. Jan.—April.

17. I. GLAUCINA, (*Pavetta glaucina*, Teysm. and Binn. in Nat. Tydsch. Ned. Ind. XXIX. 245).

HAB. Upper Tenasserim, Attaran (Falconer, Brandis).—Fl. Febr.

This differs from *I. fulgens*, Roxb., chiefly in the corolla-lobes; these are figured in Roxburgh's drawings as very acute, while Wallich's specimens of this name have them blunt. The leaves are now rather opaque, now very glossy above, and they seem to vary in shape also. *Pavetta*

Lobbii, Teysm. and Binn. (Griff. 2985), is also very near to it, but really distinct in my eyes. *Pavetta Teysmanniana*, Miq., and *Pavetta macrophylla*, Teysm. and Binn., are both the same and probably not specifically different from *Ixora congesta*, Roxb. *Ixora alba* of the Botanical Garden at Buitenzorg (not of Roxb.) appears to me to be the same as Korthals' *Pavetta calycina*, and has exactly the calyx of *I. calycina*, Thw., but otherwise the two species are entirely different. In order to avoid confusion, I suggest that the Malayan species should be called *Ixora Korthalsiana*. *Ixora jucunda*, Thw., and *Pavetta Wyckii*, Hassk., appear to me conspecific.

18. I. NIGRICANS, R. Br. in Wall. Cat. 6154; WA. Prod. I. 428; Wight Icon. t. 318. (*Pavetta nigricans*, Miq. Fl. Ind. Bat. II. 272; *I. affinis*, Wall. Cat. 6144).

Var. *α*. GENUINA, corolla-lobes acute.

Var. *β*. ERUBESCENS, (*I. erubescens*, Wall. Cat. 6143; Miq. Fl. Ind. Bat. II. 270), corolla-lobes blunt.

HAB. Var. *β*. frequent in the swamp-forests and along swampy borders of lakes, &c., from Pegu and Martaban down to Tenasserim.—Fl. March—May.

I do not think that varieties *α*. and *β*. can be retained as distinct species; both forms occur as well in Malaya as in Hindustan.

19. I. DIVERSIFOLIA, Wall. Cat. 6146; Kurz For. Fl. Burm. II. 22.

HAB. Not unfrequent in the tropical forests, especially in marshy places and on muddy banks, from Martaban down to Tenasserim.—Fl. Febr.; Fr. April, May.

Allied to *I. paludosa* (*Pavetta paludosa*, Bl. Bydr. 954; Miq. Fl. Ind. Bat. II. 271 and Ann. Mus. Lugd. Bat. IV. 198).

20. I. SPECTABILIS, Wall. Cat. 6133; Don. Gen. Syst. III. 572; Walp. Rep. II. 482.

HAB. Frequent along choungs in the tropical forests of Arracan and from Martaban down to Tenasserim.—Fl. May, June; Fr. Oct.—March.

I have not seen Wallich's specimens and identify my tree from Don's description alone.

21. I. BARBATA. Roxb. Fl. Ind. ed. Wall. I. 394; DC. Prod. IV. 487; Bot. Mag. t. 2505 and t. 4513; Wight Icon. t. 185.

HAB. Rather frequent in the tropical forests of the Andamans.—Fl. May, June.

22. I. PARVIFLORA, Vhl. Symb. III. 2. t. 52; Roxb. Fl. Ind. ed. Wall. I. 393; WA. Prod. I. 429; Hook. Bot. Misc. III. 292. suppl. t. 34; Wight Icon. t. 711; Bedd. Fl. Sylv. t. 222. (*I. decipiens*, Griff. Not. Dicot. 271 ?; *I. Pavetta*, Andr. Bot. Rep. I. t. 78).

HAB. Not unfrequent in the dry and mixed forests of the Prome District.—Fl. March.

23. I. VILLOSA, Roxb. Fl. Ind. ed. Wall. I. 392; DC. Prod. IV. 488; Wight Icon. t. 150.

HAB. Rare in the tropical forests of the eastern slopes of the Pegu Yomah (head-waters of the Khaboung stream).—Fl. May.

24. I. CUNEIFOLIA, Roxb. Fl. Ind. ed. Wall. I. 390; WA. Prod. I. 428; Bot. Reg. t. 648; Bot. Cab. t. 1215; Wight Icon. t. 1312.—(*I. oblonga*, Wall. Cat. 6147?; *Pavetta Ackeringae* Teysm. and Binn. in Natuurk. Tydsch. Ned. Ind. XXVII. 31).

Var. α. ROXBURGHII, panicle sessile or short-peduncled; leaves glabrous.

Var. β. PUBERULA (*Ix. puberula*, Wall. Cat. 6145), panicle usually longer peduncled; leaves minutely puberulous beneath.

Var. γ. PUMILA, only 1—3 ft. high, simple or nearly so; flowers often pale rose-coloured; corymbs small and short, more slender; leaves glabrous.

HAB. Frequent (var. α. and β.) in the tropical forests along the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim; var. γ. Martaban, in the eng-forests.—Fl. Febr.—April.

A very variable plant, of which some forms closely approach *I. villosa*. I identify Roxburgh's species from the Wallichian specimens thus named, which have pubescent inflorescences, while Roxburgh's drawings exhibit sessile glabrous corymbs. Var. γ. may form a distinct species, but (being a laterite plant) it shews no other differences except such reductions and modifications of growth as can be explained by the influence of the peculiar substratum on which it grows.

25. I. HELFERI, Kurz in Journ. As. Soc. Beng. 1872. 316.

HAB. Tenasserim (Helf. 3008).

The specimens before me are incomplete but very much resemble the following species.

26. I. LONGIFOLIA, Don Gen. Syst. III. 573; Walp. Rep. II. 482 (*I. macrophylla*, R. Br. in Wall. Cat. 6165, non Bl. nec alior.).

HAB. Martaban, are in the tropical forests of Toukyeghat east of Tounghoo, Fl. May or June.

Gynochthodes, Bl.

1. G. MACROPHYLLA, Kurz in Journ. As. Soc. Beng. 1872, 314, and in Trim. Journ. Bot.

HAB. Along the coasts of the Andamans.—Fl. May.

Morinda, L.

Conspectus of Species.

Subg. 1. *Morinda*, L. Corolla-limb 5- rarely 6-lobed. Stamens as many. Erect shrubs or trees.

* *Stamens exserted.*

All parts glabrous; flower-heads on short, leaf-opposed peduncles, ...*M. exserta.*

* * *Stamens included in the corolla-tube.*

× All parts more or less tomentose or pubescent.

All parts shortly and roughish pubescent; corolla glabrous, ...*M. leiantha.*

All parts (also the corolla) softly and shortly tomentose, ...*M. tomentosa.*

× × All parts (also the corolla) glabrous.

+ Flower-heads solitary. ~~and~~ leaf-opposed.

† Flower-heads longer or shorter peduncled.

Stipules rounded or blunt; corolla-throat hairy; berries united into a fleshy greenish white syncarp, ...*M. citrifolia.*

Stipules acute or acuminate; corolla-tube naked; berries purplish black, only few developed on the thick torus,..*M. angustifolia.*

† † Flower-heads sessile or nearly so.

Low shrub; quite glabrous or minutely scabrous,.......................*M. persicaefolia.*

† † Flower-heads in a peduncled terminal cyme.

Quite glabrous; corolla-tube only ¼ in. long, the lobes as long, ...*M. Wallichii.*

Subg. 2. *Lucinaea*, DC. Corolla-limb 4-parted. Stamens 4. Scandent shrubs.

* *Calyx truncate.*

Flower-heads peduncled, in terminal umbels; peduncles sparingly pubescent, the other parts glabrous; leaves pale-coloured and opaque beneath, the nerves not prominent, ...*M. umbellata.*

As preceding, but leaves glossy on both sides, the net-venation prominent, *M. tetrandra.*

* * *Calyx 4-toothed. All parts glabrous.*

Calyx sulcate; flower-heads by threes in a peduncled poor brachiate terminal cyme, .. *M. speciosa.*

1. M. LEIANTHA, Kurz in Journ. As. Soc. Beng. 1872. 313.

HAB. Tenasserim, Moulmein District (Falconer).—Fl. Febr.

2. M. TOMENTOSA, Heyne in Roth Nov. sp. 147; DC. Prod. IV. 448; WA. Prod. I. 420. (*M. multiflora*, Roxb. Fl. Ind. ed. Wall. II. 200).

HAB. Not unfrequent in the mixed dry forests of the hills in Prome District.—Fl. March.

3. M. CITRIFOLIA, L. sp. pl. 250; DC. Prod. IV. 446.; Roxb. Fl. Ind. I. 541; Miq. Fl. Ind. Bat. II. 242; Bedd. Fl. Sylv. t. 220.

Var. α. GENUINA, stipules blunt; syncarps the size of a hen's egg, or somewhat larger.

Var. β. BRACTEATA, (*M. bracteata*, Roxb. Fl. Ind. ed. Wall. II. 189; Wight Ill. t. 126), stipules often acute; syncarps much smaller.

HAB. Var. α. only planted all over Pegu and Martaban, and elsewhere; var. β. not unfrequent in the tropical forests of the Andamans. —Fl. April, May.

4. M. ANGUSTIFOLIA, Roxb. Fl. Ind. ed. Wall. II. 201 and Corom. Pl. III. t. 237; DC. Prod. IV. 447, non Roth.

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim; Ava, Khakyen hills; frequently cultivated all over the country. —Fl. March, April.

5. M. PERSICÆFOLIA, Ham. in Trans. Linn. Soc. XIII. 535; DC. Prod. IV. 447.

Var. *a.* GENUINA, all parts quite glabrous.

Var. *β.* SCABRA, all softer parts more or less rough from a minute indistinct pubescence.

HAB. Common in the savannahs from Ava and Martaban down to Upper Tenasserim; var. *β.* in the dry forests of the Prome District.—Fl. March—May; Fr. June.

6. M. WALLICHII, Kurz in Journ. As. Soc. Beng. 1872. 313.

HAB. Tenasserim (Revd. Parish, 316).

7. M. TETRANDRA, Jack Mal. Misc. II. 13; Roxb. Fl. Ind. ed. Wall. II. 201; Miq. Fl. Ind. Bat. II. 246.

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim.

8. M. SPECIOSA, Wall. Cat. 8436; Kurz For. Fl. Burm. II. 62. (*Rennellia speciosa*, Bth. and Hf. Gen. pl. II. 118).

HAB. Upper Tenasserim, Chappedong hills (Wall.).

Vangueria, Comm.

Conspectus of Species.

+ Unarmed.

All parts glabrous; stigma mitre-shaped, ... *V. edulis.*

× × Armed with opposite sharp spines.

All parts glabrous; berries about an inch thick, ... *V. spinosa.*

All softer parts (also the corolla) pubescent; berries up to ½ inch thick, ... *V. pubescens.*

*1. V. EDULIS, Vhl. Symb. III. 36; WA. Prod. I. 421; Miq. Fl. Ind Bat. II. 249.—(*V. Commersonii*, Desf. in Jacq. Hort. Schoenb. I. t. 44).

HAB. Chittagong, planted in gardens (Wall.).

2. V. SPINOSA, Roxb. Fl. Ind. ed. Wall. II. 172; DC. Prod. IV. 454.

HAB. Not unfrequent in the mixed dry forests of the Prome District. Fl. March.

3. V. PUBESCENS, Kurz in Journ. As. Soc. Beng. 1872. 314.

HAB. Here and there in the eng and the mixed dry forests from Ava and Martaban down to Pegu.—Fl. March, April.

Plectronia, L.

(*Polyozus*, Miq., non Lour.)

Conspectus of Species.

* *Pyrenes quite smooth, triangular and almost keeled.*

Unarmed, glabrous; flowers in dichotomous elongate-branched cymes, ... *P. glabra.*

* * *Pyrenes more or less wrinkled and tubercled, rounded on the back.*

× Unarmed shrubs or trees.

All parts glabrous and glossy ; flowers cymose, ... *P. didyma.*

Branchlets and nerves of leaves pubescent ; flowers on long capillary pedicels, solitary or paired, ... *P. gracilipes.*

× × Armed with opposite (rarely ternary) sharp spines, which are usually decussately placed.

+ Branchlets more or less rusty or tawny pubescent.

Leaves pubescent on both sides, or hispid above ; drupes the size of a pea, *P. parvifolia.*

Leaves glabrous, or the mid-rib beneath slightly pubescent ; drupes the size of a small cherry, ... *P. horrida.*

+ + All parts perfectly glabrous.

Leaves glossy, caudate-acuminate ; flowers clustered, ... *P. angustifolia.*

Leaves more or less blunt, glaucescent beneath ; flowers in peduncled cymes, .. *P. parvifolia.*

1. P. GLABRA, Bth. and Hf. (*Canthium glabrum*, Bl. Bydr. 967 ; DC. Prod. IV. 473 ; Miq. Fl. Ind. Bat. II. 254 ; *Canthium recurvum* Wall. MS. ap. Voigt Hort. Calc. 389).

HAB. In the tropical forests of the southern spurs of the Pegu Yomah and in Tenasserim ; also Andamans.—Fl. RS. ; Fr. Jan.

2. P. DIDYMA, Bth. and Hf. (*Canthium didymum*, Gærtn. Fruct. III. 94. t. 196 ; Roxb. Fl. Ind. ed. Wall. II. 171 ; WA. Prod. I. 425 ; Bedd. Fl. Sylv. t. 221 ; *Canthium umbellatum*, Wight Icon. t. 1034 ; *Canthium spirostylum*, Miq. Ann. Mus. Lugd. Bat. IV. 251 ; *Canthium lucidulum*, Miq. l. c. 254).

HAB. Tenasserim (Helf. 2972).

Two different species may really be included in the above synonymy. *Canthium oliganthum*, Miq. and *Canthium umbelligerum*, Miq. Ann. Mus. Lugd. Bat. IV. 251, are both referable to *Canthium lucidum*, Hook. and Arn.

3. P. GRACILIPES, Kurz For. Fl. Burm. II. 36 (*Canthium gracilipes*, Kurz in Journ. As. Soc. Beng. 1872. 314).

HAB. Rather frequent in the tropical forests of the Andamans, especially along the western side.—Fr. April, May.

Much resembling *Vangueria Miqueliana* (*Pyrostria ? spinosa*, Miq. Fl. Ind. Bat. II. 313), but differs in the absence of spines, in its larger leaves, and in the different fruits.

4. P. PARVIFOLIA, Bth. and Hf. (*Canthium parvifolium*, Roxb. Fl. Ind. ed. Wall. II. 170 ; DC. Prod. IV. 474 ; *Canthium scandens*, Bl. Bydr. 966 ; Miq. Fl. Ind. Bat. II. 255).

HAB. Not unfrequent in the low forests and in cleared shrubby places of the southern parts of Pegu : Chittagong (Roxburgh).—Fl. RS.

5. P. HORRIDA, Bth. and Hf. (*Canthium horridum*, Bl. Bydr. 966 ; DC. Prod. IV. 474 ; Miq. Fl. Ind. Bat. II. 255 and Ann. Mus. Lugd. Bat. IV. 251).

HAB. Tenasserim, Tavoy (Wall. Cat. 8298. C.)

6. P. ANGUSTIFOLIA, Bth. and Hf. (*Canthium angustifolium*, Roxb. Fl. Ind. ed. Wall. II. 169; DC. Prod. IV. 479; *Canthium Leschenaultii*, WA. Prod. I. 426; Wight Icon. t. 826).

HAB. Hills of Chittagong (Roxburgh).—Fl. March—July.

I have found another small-leaved glabrous unarmed shrub in the swamp-forests of Pegu apparently belonging to this genus, but unfortunately without flower or fruit. In habit it somewhat resembles *P. parviflora*, Bth. and Hf.—*Gardenia parvifolia*, Wall. Cat. 8256 from Tavoy, of the habit of *Damnacanthus*, is sterile and, therefore, indeterminable.

Guettarda, L.

1. G. SPECIOSA, L. sp. pl. 1408; Roxb. Fl. Ind. I. 686; Wight Icon. t. 40; WA. Prod. I. 422; Bot. Reg. t. 1393.

HAB. Common in the beach-forests and generally along the sea-coasts of Tenasserim and the Andamans.—Fl. April, May.

Polyphragmon, Desf.
(*Timonius*, Rumph.)

1. P. FLAVESCENS, (*Helospora flavescens*, Jack in Linn. Trans. XIV, 127. t. 4. f. 3.; DC. Prod. IV. 394; Miq. Fl. Ind. Bat. II. 234).

Var. β. MACROCARPUM, leaves larger and of thinner texture; drupes the size of a small cherry; seeds oblong, about 2 lin. long.

HAB. Var. β. in the tropical forests of South Andaman.—Fl. April, May; Fr. March.

Var. β. may be distinct, but the species of *Polyphragmon* belonging to the immediate affinity of *P. flavescens* are difficult to understand.

Gardenia, L.
Conspectus of Species.

Subg. 1. *Eu-Gardenia.* Unarmed. Stipules more or less connate into a sort of a sheath. Flowers showy, salver-shaped, the tube long. Calyx various.

* *Flowers and berries sessile or nearly so.*

Leaves almost sessile, scabrous; berries globular, in the forks of the branchings, .. *G. obtusifolia.*

* * *Flowers (and berries) on short pedicels* 3—5 *lin. long.*

Leaves glabrous, with a tuft of hairs in the nerve-axils beneath; calyx-limb deeply 5-cleft; berry oblong, terete, ... *G. resinifera.*

Leaves glabrous; calyx-limb laterally cleft and more or less spathaceous; berry oblong, more or less distinctly ribbed, ... *G. coronaria.*

Subg. 2. *Campanularia.* Unarmed. Stipules connate or almost free. Corolla campanulate-funnel-shaped with a ventricose-inflated tube. Leaves glossy.

Tree; leaves coriaceous, with a gland in the nerve-axils beneath; flowers large and showy, ... *G. pulcherrima.*

Low shrub 1—3 ft. high; leaves membranous; flowers middling-sized, white, .. *G. hygrophila.*

Subg. 3. *Randioides.* *Randia*-like trees or shrubs, armed with opposite sharp spines (abortive branchlets). Stipules free, very deciduous. Flowers comparatively small.

* *All parts (also the leaves) glabrous. Calyx-lobes herbaceous or leafy.*

Leaves more or less lanceolate; flowers pedicelled, by 2 or more clustered; calyx about 2 lin. long, ... *G. campanulata.*

* * *All parts more or less pubescent, villous, or tomentose.*

× Fertile flowers sessile, hermaphrodite-sterile ones in cymes. Calyx-lobes herbaceous or leafy. Flowers green.

Bark grey; fertile and sterile flowers on the same plant; berries plumply beaked, terete, ... *G. sessiliflora.*

Bark red; fertile and sterile flowers usually on separate trees; berries slightly ribbed, .. *G. erythroclada.*

× × All flowers fertile, or at least the fruits all conform and equally well developed. Calyx truncate or minutely toothed. Flowers white or yellow.

Calyx puberulous; berry smooth; branches silvery white; leaves quite glabrous, .. *G. cuneata.*

Calyx minutely pubescent; berry roughish, glabrous; branchlets grey; leaves pubescent beneath, ... *G. turgida.*

Calyx velvety-tomentose; berry densely brown-velvety, ... *G. dasycarpa.*

1. G. OBTUSIFOLIA, Roxb. Hort. Beng. 15; Kurz For. Fl. Burm. II. 42 (*G. suavis*, Wall. Cat. 8274).

HAB. Frequent in the eng and dry forests from Prome and Martaban down to Upper Tenasserim.—Fl. March, April; Fr. the following year.

2. G. RESINIFERA, Roth Nov. spec. 150, non Korth. (*G. lucida*, Roxb. Fl. Ind. I. 707; WA. Prod. I. 395; DC. Prod. IV. 395; Wight Icon. t. 575).

HAB. Chittagong (Roxb.).

3. G. CORONARIA, Ham. in Symes Embassy Ava. 474. c. tab. (*Gard. costata*, Roxb. Fl. Ind. I. 704; DC. Prod. IV. 380; *G. carinata*, Griff. Not. Dicot. 261. t. 474. f. 3).

HAB. Frequent in the moister mixed forests, rare in the low forests of Pegu, Martaban, and Tenasserim; also Chittagong.—Fl. April; Fr. the following year.

4. G. PULCHERRIMA, Kurz in Journ. As. Soc. Beng. 1872. 312.

HAB. Not unfrequent in the tropical forests of the Andamans.—Fl. May; Fr. April of the following year.

G.? ixorifolia, R. Br. in Wall. Cat. 8262, from Tavoy (leaves only), is near allied to the above, but apparently different.

5. G. HYGROPHILA, Kurz in Journ. As. Soc. Beng. 1872. 312.

HAB. Frequent in the swamp-forests and in swampy places in the savannahs of the Irrawaddi alluvium in Pegu and the Prome district.—Fl. Jan.

6. G. CAMPANULATA, Roxb. Fl. Ind. I. 710; DC. Prod. IV. 383; Wight Icon. t. 578.

HAB. Chittagong; in the tropical forests of Pegu above Rangoon; Upper Tenasserim, Ta-oo table-land (Dr. Brandis).

7. G. SESSILIFLORA, Wall. Cat. 8291; Kurz in For. Fl. Burm. II. 40.

HAB. Frequent in the mixed and dry forests, especially in the lower mixed ones and in the savannahs, all over Burma, from Ava and Martaban down to Tenasserim.—Fl. April—May; Fr. CS.

8. G. ERYTHROCLADA, Kurz in Journ. As. Soc. Beng. 1872. 311.

HAB. Common in the mixed and dry forests all over Burma, from Ava and Martaban down to Upper Tenasserim.—Fl. April, May; Fr. CS.

9. G. CUNEATA, R. Br. MS.; Kurz For. Fl. Burm. II. 41 (*Randia cuneata*, Wall. Cat. 8263).

HAB. Ava, left bank of the Irrawaddi below Ava.—Fr. Sept.

10. G. TURGIDA, Roxb. Fl. Ind. I. 711; DC. Prod. IV. 382; Wight Icon. t. 579.

HAB. Frequent in the eng and dry forests of Prome and of the Irrawaddi zone of Pegu.—Fl. March, April; Fr. March of the following year.

11. G. DASYCARPA, Kurz in Journ. As. Soc. Beng. 1872. 412 (*Gard. tomentosa*, Wall. Cat. 8264, non Bl.).

Not unfrequent in the mixed dry and the eng-forests of the Prome District; also in Upper Tenasserim.—Fl. April; Fr. the following year.

Randia, L.

Conspectus of Species.

* *Corolla almost rotate, large (up to nearly $1\frac{1}{2}$ in. across).*

Leaves glossy, glabrous; berries large, sessile or peduncled, ... *R. uliginosa.*

* * *Corolla salver-shaped, rather small (about 4 lin. in diameter or less.)*

Glabrous or sparingly hirsute; calyx glabrous or nearly so; berries glabrous or sprinkled with minute hairs, ... *R. longispina.*

More or less shortly puberulous; calyx densely pubescent or almost villous; berries tawny-velvety, ... *R. nutans.*

1. R. ULIGINOSA, DC. Prod. IV. 386; WA. Prod. I. 398; Wight Icon. t. 397. (*Posoqueria uliginosa*, Roxb. Fl. Ind. I. 712; *Gardenia uliginosa*, Retz. Obs. II. 14; Roxb. Corom. Pl. II. t. 135).

HAB. Frequent in the savannahs and in swampy grounds all over Burma, from Ava and Martaban down to Upper Tenasserim.—Fl. April—June; Fr. CS.

This species, and likely all true species of *Randia*, exhibit the same peculiar dimorphism of the fruit as some species of section *Randioides* of *Gardenia*. But here the peduncled fruits differ only in size, while they produce perfect seeds.

2. R. LONGISPINA, DC. Prod. IV. 386; WA. Prod. I. 398. (*Posoqueria longispina*, Roxb. Fl. Ind. I. 716; *Randia sp.* Griff. Not. Dicot. 261 ?).

HAB. In the tropical forests of the southern slopes of the Pegu Yomah.—Fl. April; Fr. May—July.

3. R. NUTANS, DC. Prod. IV. 386; WA. Prod. I. 397 (*Posoqueria nutans*, Roxb. Fl. Ind. ed. Wall. II. 565).

HAB. Common in the mixed forests all over Pegu and Martaban.—Fl. April; Fr. May—July.

Doubtful Species.

1. *R. exaltata*, Griff. Not. Dicot. 262.

HAB. Tenasserim, Mergui, in low lands, with mangroves, Pullow (Griff.).—Fl. Fr. Jan.

2. *R. polysperma*, Roxb. Fl. Ind. ed. Wall. II. 147.

HAB. Chittagong.—Fl. May; Fr. Aug., Sept.

N. B. No *Randia*, but indeterminable for the present.

Webera, Schreb.

Conspectus of Species.

Subg. 1. *Eu-Webera.* Stigma entire. Erect shrubs or trees, unarmed.

* *Cymes terminal or in the forks of the branchings.*

All parts (also the inflorescence) quite glabrous, ... *W. Asiatica.*
Glabrous; inflorescence grey pubescent, ... *W. glomeriflora.*

* * *Cymes or corymbs leaf-opposed.*

All parts glabrous; cymes puberulous, ... *W. oppositifolia.*

Subg. 2. *Griffithia*, WA. Stigma 2-lobed. Shrubs, often scandent, armed with straight or recurved spines.

* *Spines recurved. Scandent shrubs.*

× Inflorescence quite glabrous.

Corolla-tube $\frac{3}{4}$—$1\frac{1}{4}$ in. long, ... *W. longiflora.*
Corolla-tube hardly longer than the calyx (2 lin. long), ... *W. Siamensis.*

× × Inflorescence and calyx appressed-pubescent.

Corolla-tube about 3 lin. long, ... *W. bispinosa.*

* * *Spines straight. Erect or straggling shrubs.*

Flowers sessile or almost sessile between 2 connate bractlets, ... *W. fasciculata.*
Flowers solitary, on a slender bractless pedicel, ... *W. myrtifolia.*

1. W. GLOMERIFLORA, Kurz in Journ. As. Soc. Beng. 1872. 311.

HAB. Rare in the tropical forests of the interior parts of the Pegu Yomah (head-waters of the Toungnyo choung).—Fl. probably March or April; Fr. Febr.

The leaves are exactly like those of *Griffithia rugulosa*, Thw.

2. W. OPPOSITIFOLIA, Roxb. Fl. Ind. ed. Wall. II. 525. (*W. densiflora*, Wall. in Roxb. Fl. Ind. II. 536; *Stylocoryne densiflora*, Miq. in Ann. Mus. Lugd. Bat. IV. 128. t. 5. fig. A.; *Cupania densiflora*, DC. Prod. IV. 394; *Randia densiflora*, Bth. Fl. Hongk. 155; *Gynopachys axilliflorus*, Miq. in Fl. Ind. Bat. II. 221).

Var. α. GENUINA, calyx 2 lin. long or somewhat longer, the limb more bell-shaped, almost glabrous; flowers in shorter cymes; berries the size of a large pea.

? Var. *β.* FLORIBUNDA, calyx about 1½ lin. long or shorter, densely pubescent, the limb shorter; flowers in densely pubescent slender divaricate corymbs; berries half the size.

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban to Tenasserim and the Andamans; also Chittagong; var. *β.* in the tropical forests of the Andamans, rather frequent.—Fl. April June; Fr. Oct.

3. W. LONGIFLORA, (*Randia longiflora*, Lamk. Dict. III. 26; DC. Prod. IV. 386; *Posoqueria longiflora*, Roxb. Fl. Ind. ed. Wall. II. 569; *Griffithia fragrans*, Miq. Fl. Ind. Bat. II. 208, non WA.).

HAB. Rather frequent in the tropical forests of the Andamans and Tenasserim; also Chittagong.—Fl. March—May; Fr. June, July.

This, as other species of *Griffithia*, have the cymes not strictly axillary but arising from the end of, or laterally from, the transformed spine-like branchlets.

4. W. SIAMENSIS, (*Griffithia Siamensis*, Miq. Ann. Mus. Lugd. Bat. IV. 130; *Canthium ? angulosum*, Wall. Cat. 8285. A.).

HAB. Upper Tenasserim (Wall.).—Fl. March.

5. W. BISPINOSA, (*Stylocoryne bispinosa*, Griff. Not. Dicot. 260).

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. April, May.

6. W. FASCICULATA, (*Posoqueria fasciculata*, Roxb. Fl. Ind. ed. Wall. 568; *Posoqueria rigida*, Wall. in Roxb. l. c. 570; *Randia rigida*, and *R. fasciculata*, DC. Prod. IV. 386).

HAB. Tenasserim, about Moulmein (Rev. Parish).

7. W. MYRTIFOLIA, Kurz For. Fl. Burm. II. 49 (*Gardenia myrtifolia*, Wall. Cat. 8255. D.)

HAB. Frequent in the swamp-forests of the Irrawaddi alluvium in Pegu; Tenasserim, Moulmein (Wall.).—Fl. May.

Diplospora, DC.

1. D. SINGULARIS, Korth. in Ned. Kruidk. Arch. II. 200; Miq. Fl. Ind. Bat. II. 238 and Ann. Mus. Lugd. Bat. IV. 250. (*Discospermum sphaerocarpum*, Dalz. in Hook Kew Journ. Bot. II. 257 ?)

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and more frequent in those of Martaban, Tenasserim, and the Andamans.—Fl. April, May.

Hypobathrum, Bl.

Conspectus of Species.

Subg. 1. *Petunga*, DC. Flowers 4-merous; the calyx-limb persistent. Berry contracted into a longer or shorter stalk (the elongating pedicel).

Glabrous; flowers in axillary spikes, ... *H. racemosum.*

Subg. 2. *Hyptianthera,* WA. Flowers 5- rarely 4-merous, the calyx-limb persistent. Berry sessile.

Glabrous; flowers in axillary clusters, ... *H. strictum.*

1. H. RACEMOSUM, (*Randia racemosa,* Roxb. Fl. Ind. I. 144; *Petunga Roxburghii,* DC. Prod. IV. 399; *Petunga variabilis,* Hassk. Cat. Hort. Bog. 114; Miq. Fl. Ind. Bat. II. 201, cum syn.).

HAB. Not unfrequent in the swamp-forests and in swampy or marshy places along choungs or around lakes of Pegu and Martaban, and no doubt elsewhere.—Fl. Oct.—Dec.; Fr. Dec.—April.

2. H. STRICTUM, (*Hyptianthera stricta,* WA. Prod. I. 399; *Randia stricta,* Roxb. Fl. Ind. I. 526; *Rondeletia stricta,* Roth Nov. sp. 140).

HAB. Chittagong (Hf. and Th.); Ava, Bhamo (J. Anderson).—Fl. Sept.; Fr. Febr.

Brachytome, Hf.

1. B. WALLICHII, Hf. Icon. plant. t. 1088.

HAB. Ava (Griff. 2787); Kakhyen hills (J. Anderson).—Fl. April.

Inflorescence, flowers, and berries very like those of *Saprosma ternatum,* but the last are many-seeded.

Morindopsis, Hf.

1. M. CAPILLARIS, Kurz in Journ. As. Soc. Beng. 1874. 189 (*Psilobium capillare,* Kurz l. c. 1873. 313).

HAB. Frequent in the swamp-forests of Pegu and Martaban down to Tenasserim.—Fl. April, May.

Mussænda. L.

Conspectus of Species.

* *Calyx-limb deciduous, leaving an angular scar at the top of the berry.*

× Calyx-teeth ½—1 lin. long.

Calyx-teeth erect, lanceolate; branchlets puberulous or velvety, ... *M. glabra.*

Calyx-teeth as in preceding but reflexed; branchlets hirsute, ... *M. variolosa.*

× × Calyx-lobes 2—4 lin. long.

Calyx-lobes filiform, 2—2½ lin. long, all conform and none expanded leaf-like, .. *M. pavettæfolia.*

Calyx-lobes linear, 2—3 lin. long; corolla-lobes nearly half as long as the corolla-tube, .. *M. macrophylla.*

Calyx-lobes lanceolate, about ½ in. long; corolla-lobes about ¼ as long as the corolla-tube, ... *M. calycina.*

* * *Calyx-limb persistent, crowning the berry.*

Calyx-teeth linear-subulate, about 4 lin. long; corymbs rather compact .. *M. corymbosa.*

1. M. GLABRA, Vhl. Symb. III. 38; DC. Prod. IV. 370.

Var. α. GENUINA, more glabrous, especially the leaves and branches.

Var. β. WALLICHII, (*M. Wallichii,* Don. Gen. Syst. III. 490), leaves pubescent beneath and along the nerves above, petioles shorter.

HAB. In the drier hill-forests of Martaban east of Tounghoo, at 3000 to 4000 ft. elevation.—Fl. Fr. March.

2. M. VARIOLOSA, Wall. Cat. 6259; Don. Gen. Syst. III. 490; Miq. Fl. Ind. Bat. II. 215.

HAB. Rather rare in the tropical forests of the southern parts of the Pegu Yomah, more frequent in Tenasserim from Moulmein southwards; also Arracan, Sandoway, &c.—Fl. Sept.—Febr.

M. parva, Wall. Cat. 6261 (Don. Gen. Syst. III. 491) from Tavoy, possibly belongs here, but the only specimen seen by me is not sufficient for a correct identification.

3. M. PAVETTÆFOLIA, Kurz For. Fl. Burm. II. 57.

HAB. Not unfrequent in the tropical forests of Martaban, east of Tounghoo.—Fl. June?

The leaves much resemble those of the glabrescent form of *Ixora tomentosa.*

4. M. MACROPHYLLA, Wall. in Roxb. Fl. Ind. II. 228; DC. Prod. IV. 371, non Schum.

HAB. Frequent in the tropical forests of the Andamans, especially along the coasts.—Fl. May, June; Fr. June, July.

5. M. CALYCINA, Wnll. Cat. 6253; Don. Gen. Syst. 489; Miq. Fl. Ind. Bat. II. 214.

HAB. Not unfrequent in the mixed and mixed dry forests, from Ava and Prome to Pegu, especially along choungs.

6. M. CORYMBOSA, Roxb. Fl. Ind. ed. Wall. II. 226; DC. Prod. IV. 371; WA. Prod. I. 393.

HAB. Not unfrequent in the upper mixed forests of the Kolodyne district in Arracan; also Upper Tenasserim, Moulmein (Falconer).—Fr. Octob.

Acranthera, Arn.

1. A. UNIFLORA, Kurz in Journ. As. Soc. Beng. 1872. 312. (*Mussænda uniflora*, Wall. Cat. 6264; Don. Gen. Syst. III. 491).

HAB. Tenasserim, Moulmein, in woods, plentiful (R. Scott); Tavoy (Wall.).—Fl. June; Fr. Aug.

Adenosacme, Wall.

1. A. LONGIFOLIA, Wall. Cat. 6280 A; Miq. Fl. Ind. Bat. II. 217. (*Rondeletia longifolia*, Wall. in Roxb. Fl. Ind. II. 138).

HAB. Rare in the tropical forests of the southern and eastern slopes of the Pegu Yomah; more frequent in those of Martaban and Tenasserim, up to 3000 ft. elevation.—Fr. Jan.—March.

In the tropical forests of the valleys of the Nattoung hills (Martaban) grows another species, apparently new, which has very short thick petioles and the uppermost leaves almost sessile; but the specimens are too bad for description.

Myrioneuron, R. Br.

Conspectus of Genera.

Glabrous; cymes compact and head-like, densely bracted, nodding; bracts subulate, rigid, ... *M. nutans.*
Branches hirsute; cymes corymb-like, trichotomous, hirsute, erect; bracts broad, membranous, hirsute, ... *M. hirsutum.*

1. M. NUTANS, R. Br. in Wall. Cat.; Kurz For. Fl. II. 55.

HAB. Chittagong-hills, Kassalong (C. B. Clarke).—Fr. CS.

2. M. HIRSUTUM, Kurz For. Fl. Burm. II. 55.

HAB. Ava, hills east of Bhamo (J. Anderson).—Fl. May.

Urophyllum, Jack and Wall.

Conspectus of Species.

* *Ovary and berry 5—6-celled. Flowers in shorter or longer simple or decompound umbelets or cymes.*

Leaves and shoots glabrous; calyx about 2 lin. across, ... *U. glabrum.*
Leaves beneath and shoots more or less pubescent; calyx a line across, .. *U. strigosum.*

* * *Ovary and berry 2-celled. Flowers in sessile clusters.*

All parts glabrous; flowers minute, ... *U. biloculare.*

1. U. GLABRUM, Jack and Wall. in Roxb. Fl. Ind. II. 184; DC. Prod. IV. 441. (*Axanthes longifolia*, Wight in Maccl. Calc. Journ. VII. and Icon. t. 1165).

HAB. Tenasserim, Mergui (*teste* Wight).

2. U. STRIGOSUM, Korth. in Ned. Kruidk. Arch. II. 194; Miq. Fl. Ind. Bat. II. 223.

HAB. Tenasserim (or Andamans?) (Helf. 2940 and 2944).

3. U. BILOCULARE, Kurz in Journ. As. Soc. Beng. 1872. 313.

HAB. Rather rare in the tropical forests of the Martaban hills east of Toungboo.—Fr. March.

Rubia, L.

Conspectus of Species.

Leaves more or less cordate-ovate, long-petioled, 3—5-nerved, ... *R. cordifolia.*
Leaves narrow-linear, sessile, 1-nerved, ... *R. angustissima.*

1. R. CORDIFOLIA, L. Mant. 197; DC. Prod. IV. 588; WA. Prod. I. 442; Miq. Fl. Ind. Bat. II. 337. (*R. Munjista*, Roxb. Fl. Ind. ed. Wall. I. 383; *R. scandens*, Zoll. and Mor. Syst. Verz. 66; *R. purpurea*, Dcne. Mém. Acad. Brux. XI; Jacq. Voy. Bot. 84. t. 92).

Var. *α.* GENUINA, leaves various, more or less scabrous on the upper side and on the margins and on the nerves beneath, but not pubescent.

Var. *β.* AFFINIS, (*Rubia affinis*, Wall. Cat. 6209), leaves scabrous above, softly but shortly pubescent beneath.

HAB. Var. *β.* Ava, on Taong-dong (Wall.).—Fl. Fr. Nov.

2. R. ANGUSTISSIMA, Wall. Cat. 6207; G. Don. Gen. Syst. III. 643; Walp. Rep. II. 460. (*R. charæfolia*, Wrll. Cat. 6210; G. Don. l. c.; Walp. l. c.).

HAB. Ava, Taong-dong (Wall.).—Fl. Fr. Nov.

Galium, L.

1. G. ASPERIFOLIUM, Wall. in Roxb. Fl. Ind. I. 381; DC. Prod. IV. 598; WA. Prod. I. 442.

HAB. In open grassy places along the borders of the stunted hill-forests on Nattoung, Martaban, at about 7000 ft. elevation; Ava, Khakyen hills (J. Anderson).

DIPSACEÆ.

Conspectus of Genera.

* *Flowers not in heads, cymose or whorled.*

TRIPLOSTEGIA. Cymes dichotomous and laxly panicled. Stamens 4. Stigma terminal, straight. Small herbs.

* * *Flowers in terminal rarely axillary often peduncled heads.*

DIPSACUS. Involucre-bracts usually herbaceous, the paleas of the receptacle rigid or spinescent. Corolla 4-cleft. Rigid herbs, the flower-heads large.

Dipsacus, L.

1. D. STRICTUS, Don Prod. Fl. Nep. 161; DC. Prod. IV. 646.

Var. *α.* GENUINA, (*D. strictus*, Don. l. c.; *D. inermis*, Wall. in Roxb. Fl. Ind. I. 367), stems more or less retrorsely hispid; leaves more or less pilose.

Var. *β.* MITIS, (*D. mitis*, Don Prod. Nep. 161; *D. inermis*, Coult. Dips. 23; DC. Prod. IV. 646; *D. longicaulis*, Wall. Cat. 6856), leaves on the nerves beneath and corners of the stems sparingly beset with minute prickles, otherwise glabrous or nearly so.

HAB. Martaban, plateau of the Yoonzeleen, at 2500 ft. elevation (Dr. Brandis); Ava, Taong-dong (Wall.).—Fl. March, April.

COMPOSITÆ.

Conspectus of Genera.

Subord. I. ASTERACEÆ. Florets all tubular or bilabiate, or more usually the outer ones ligulate and forming a ray. Style-branches in the female florets always filiform, those of the hermaphrodites variously shaped (in the sterile florets sometimes the style simple). Herbs, shrubs, or rarely trees; the sap usually watery, never milky.

Trib. I. Corymbiferæ, Vaill. Florets all tubular, or more usually the marginal ones ligulate and forming a ray. Style not thickened joint-like at or near the apex. Herbs, shrubs, or trees, usually aromatic.

* *Flower-heads heterogamous, radiate or discoid, the hermaphrodite or male florets tubular, and the female ones ligulate or filiform (or rarely the heads homogamous in absence of the ray-florets).*

+ Anthers free or nearly so. Female flowers all apetalous. Flower-heads unisexual, rarely heterogamous.

Subtrib. 1. *AMBROSIEÆ.* Style of hermaphrodite florets undivided. Anthers inflexed-appendaged. Pappus none. Leaves alternate.

Xanthium. Male florets numerous, in globular heads, the involucre small, consisting of free bracts in a single row. Female florets 2 together cousolidated with the involucre into a prickly burr.

+ + Anthers always united into a tube. Style-branches truncate or appendaged.

× Pappus of short stiff awns or scales, or reduced to a raised border, or none at all. *(Genera with a similar or no pappus, not included here, should be sought for in the next division with capillary bristles).* Anther-cells not tailed at the base.

Subtrib. 2. *HELIANTHOIDEÆ.* Flowers either heterogamous, with the female florets more or less ligulate, the central ones tubular hermaphrodite or male, or rarely discoid, with all the florets hermaphrodite and tubular. Receptacles with chaffy scales between the florets, or rarely (in *Helenioideæ*) naked. Anthers without tails. Style branches truncate and penicillate, or appendiculate, or the style of the sterile flowers undivided. Pappus of stiff awns or of short scales or none. Achenes 3—4-gonous, terete, or more usually variously compressed. Leaves opposite or rarely alternate.

* *Receptacle paleaceous* (Helianthoideæ).

+ Pappus consisting of numerous scales, rarely awn-shaped (or none). (*Galinsogeæ*).

Galinsoga. Flower-heads radiate. Involucral bracts in 1 or 2 series, almost equal. Scales of pappus oblong, chaffy, fringed, or the alternate ones, or all, shortly awned. Herbs, leaves opposite. Receptacle conical.

Tridax. Flower-heads radiate. Involucral bracts in 2 rows, membranous, or the outer ones herbaceous. Scales of pappus feathery-fringed. Herbs, leaves opposite. Receptacle flat or nearly so.

+ + Pappus consisting of only 1—4 bristly awns, or cyathiform, or absent.

× Corolla of the fertile florets persistent on the achenes. Pappus of 1—3 awns (*Zinnieæ*).

Zinnia. Receptacle conical or cylindrical. Disk-florets fertile. Achenes (at least the inner ones) 1—3-aristate. Herbs, leaves opposite. Flower-heads solitary.

× × Corolla of all the flowers deciduous.

† Achenes more or less compressed from the top. Pappus of 2 (rarely 4) bristles, or none. (*Coreopsideæ*).

‡ Involucral bracts distinct, almost equal, the outer ones herbaceous, the inner almost conform to the scales of the receptacle.

GUIZOTIA. Ray-florets fertile. Achenes small, almost 4-cornered, without pappus, but crowned with the densely pilose corolla-base. Flower-heads peduncled. Leaves opposite, or the upper ones alternate.

SYNEDRELLA. Ray-florets fertile. Achenes almost flat, lacerate-winged, crowned with 2—3 awns. Herbs, leaves opposite. Flower-heads sessile or peduncled.

‡ ‡ Involucral bracts in 2 rows, the inner ones membranous, often connate at the base or higher up, the outer ones small or minute.

§ Style-branches truncate, penicellate or overtopped by a short appendage.

COREOPSIS. Ray-florets sterile or rarely fertile or none. Style-branches penicillate or truncate, with a short or obsolete appendage. Achenes flat, ciliate, or winged, rarely contracted at the top, nude or more usually terminated by 2 short awns. Leaves opposite or alternate, single to pinnatisect.

DAHLIA. Ray-florets sterile, rarely fertile. Style-branches terminating in an elongate hairy appendage. Achenes flat, wingless, naked. Leaves opposite, pinnate.

BIDENS. Ray-florets sterile, rarely fertile or none. Involucral bracts free or connate only at the base. Style-branches terminating in a short acute or shortly subulate appendage. Achenes not beaked, crowned with 2—4 stiff awns finally minutely retrorsely bearded or aculeate. Leaves opposite, simple to pinnatisect.

COSMOS. Ray-florets sterile, often rose-coloured or violet. Achenes more or less beaked. Rest as in *Bidens*. Leaves opposite, simple to pinnatisect.

GLOSSOCARDIA. Ray-florets fertile, usually solitary. Achenes narrow, flat, long-ciliate, crowned with 2 stiff smooth awns recurved afterwards. Leaves alternate, pinnatisect.

§ § Style-branches terminating in a long, shortly hairy appendage.

GLOSSOGYNE. Ray-florets fertile. Achenes long, crowned with 2 or 3 stiff persistent awns. Leaves mostly radical, dissect to 3-toothed, the cauline ones few and small.

CHRYSANTHELLUM. Ray-florets fertile. Achenes naked, those of the disk compressed with the inner ones often winged, those of the ray thick. Leaves alternate, dissect.

† † Achenes all thick, or those of the ray triquetrous, those of the disk laterally compressed. Pappus cyathimorph or of 2—3 stiff chaffy or bristly awns, with or without intermediate scalelets, or none (*Verbesineæ*).

‡ Inner involucral bracts (or outer scales of the receptacle) embracing or enveloping the achenes of the fertile ray-florets. Pappus none or of minute free scales.

ENHYDRA. Involucre of 4 broad leafy bracts, the 2 outer larger than the 2 inner. Ray-florets in several rows, with very small ligules. Pappus none. Aquatic herbs, with simple opposite leaves. Flower-heads axillary, sessile or nearly so.

SIEGESBECKIA. Outer involucral bracts leafy, narrow, spreading, gland-hairy, the inner ones and the receptacle-scales enveloping the florets. Ray-florets in a single row with small ligules or almost bell-shaped. Pappus none. Herbs with opposite leaves. Flower-heads panicled.

‡ ‡ Inner involucral bracts all flat.

§ Scales of receptacle flat, very narrow, usually only few.

ECLIPTA. Involucral bracts in 2 or 3 rows, the outer ones ovate-oblong. Disk-florets 4-toothed. Ligules small, almost 2-seriate. Pappus none, or shortly 2-awned. Style-branches obtuse and flattened. Herbs, leaves simple, opposite.

§ § Scales of receptacle concave or complicate, more or less embracing or enveloping the disk-florets.

‡ Achenes wingless, compressed or 4—5-cornered.

△ Pappus united at the base into a ring or cup.

• Flower-heads small or rather small.

BLAINVILLEA. Ray-florets fertile, with small ligules. Disk-achenes crowned with 2—5 persistent awns united at the base into a cup or ring. Herbs, leaves opposite or the upper ones alternate. Flower-heads peduncled or almost sessile. Florets white.

WEDELIA. Ray-florets fertile, with conspicuous spreading ligules. Disk-achenes crowned by numerous minute scales or fringes or by 1—2 short deciduous awns united at base into a cup or ring, or rarely the pappus very minute or obsolete. Herbs, leaves opposite, simple. Flower-heads peduncled or almost sessile. Florets yellow.

△ △ Pappus-scales or awns free from the base. Flower-heads usually large.

‡ ‡ Achenes of the disk laterally compressed (those of the ray sometimes dorsally compressed or 3-quetrous), ciliate or winged on the margins. Flower-heads small.

SPILANTHES. Ray-florets, if present, fertile. Style-branches truncate and not appendaged. Achenes usually ciliate. Awns of pappus if present very thin. Herbs, leaves opposite. Receptacle conical.

TITHONIA. Ray-florets sterile. Awns of the pappus deciduous or persistent, the intermediate scalelets persistent. Involucre-bracts striate at the base, stiff, elongate-leafy at apex. Tall herbs, leaves alternate. Flower-heads on thickened peduncles.

HELIANTHUS. Ray-florets, if present, sterile. Awns of the pappus deciduous, often paleaceous, without intermediate scalelets. Tall herbs, leaves usually simple, opposite or alternate.

* * *Receptacle naked* (Helenioideæ).

TAGETES. Involucre-bracts oily-glandular, in a single row, united into a toothed cup. Pappus of 5—6 unequal scales or awns. Flower-heads usually radiate. Herbs, leaves opposite, pinnatisect or serrate.

Subtrib. 3. *CALENDULACEÆ.* Flower-heads usually heterogamous, the ray-florets ligulate, female or rarely neuter, the disk-florets tubular, hermaphrodite, but sterile or rarely fertile (very rarely the heads homogamous and discoid). Receptacle naked. Anthers usually with sagittate, but scarcely tailed base. Style-branches in the disk-florets more or less concrete and thickened at the base. Achenes often heteromorph and variously curved. Pappus none, or replaced by a woolly crown. Leaves alternate, or radical.

CALENDULA. Rays rather long, spreading. Achenes much incurved, muricate on the back, the margins sometimes dilated but not winged, those of the disk all abortive. Pappus none.

Subtrib. 4. *ANTHEMIDEÆ.* Flower-heads heterogamous, the females ligulate or filiform or without corollas, the disk-florets hermaphrodite or male, or very rarely all the florets tubular and hermaphrodite. Receptacle naked, or very rarely scaly. Anthers tailless. Style-branches truncate or penicillate, rarely shortly appendaged. Pappus none, or reduced to a raised border or rarely of short scales. Leaves usually alternate.

* *Receptacle paleaceous. Flower-heads radiate, or rarely homogamously discoid.*

ACHILLEA. Involucre ovoid, bell-shaped or rarely hemispherical. Achenes compressed, narrowly margined. Herbs or undershrubs, the leaves alternate.

* * *Receptacle naked, or alveolate-fibrillose.*

× Flower-heads radiate. Involucre bracts rather broad.

CHRYSANTHEMUM. Receptacle flat or convex. Achenes regularly or irregularly 5—10-ribbed. Pappus none, or rarely of very short scales or forming a cup.

× × Flower-heads heterogamous, discoid. (*Cotuleæ*).

+ Florets of the circumference few. Achenes obovate or rounded at the top.

ARTEMISIA. Involucre-bracts in few rows. Achenes almost terete or compressed, 2- or thinly many-ribbed or without ribs. Herbs or undershrubs, the leaves dissect to simple. Flower-heads small, in racemes or panicled racemes.

+ + Florets of circumference very numerous. Achenes flat or concave at the top. Flower-heads spherical or hemispherical.

COTULA. Florets of the circumference without any or with a very short broad or conical corolla, the hermaphrodite florets 4-toothed, with a widened or thin tube. Achenes flat, obtuse or truncate. Flower-heads peduncled. Small herbs.

MYRIOGYNE. Florets of the circumference with a 2—3-cleft corolla nearly as long as the style, the hermaphrodite florets 4-toothed. Bracts of involucre small and much shorter than the 3—4-cornered achenes. Flower-heads sessile, minute. Prostrate herbs.

CENTIPEDA. As preceding but involucral bracts large and broad, in fruit connivent and covering the cylindrical slightly striate achenes. Prostrate herbs. Flower-heads sessile, small.

× × Pappus usually of numerous capillary soft bristles, (rarely paleaceous or none).

O Anthers tailed at the base.

Subtrib. 5. *INULOIDEÆ.* Flower-heads heterogamous, discoid or radiate, or homogamous in absence of the ray-florets. Anther-cells terminating in a basal bristle or tail. Style-branches linear, obtuse and not appendaged (or the style undivided in the sterile florets). Leaves usually alternate.

* *Female flowers if present ligulate.*

× Bristles of pappus all conform and almost equal, capillary, copious.

INULA. Flower-heads heterogamous. Involucre-bracts in many rows, narrow or leafy-appendaged. Ray-florets few, in 1 or 2 rows, disk-florets numerous. Anthers with double tails. Achenes not or 4—5-ribbed. Herbs or undershrubs.

× × Pappus unequal, the outer consisting of short bristles or more usually of minute scales, rarely no pappus at all.

+ Pappus present (rarely absent).

PULICARIA. Flower-heads heterogamous, the ray-florets in 1 or 2 rows, yellow. Involucre broad, the bracts narrow, in few rows, the outer ones herbaceous. Achenes ribbed or not. Bristles of inner pappus in a single row, the outer pappus of very short scales more or less connate into a crown or slit cup.

Vicoa. Flower-heads heterogamous or homogamous. Involucre usually broad, the bracts narrow, in many rows. Achenes hardly ribbed. Bristles of pappus very thin, in a single row, rarely intermixed with a few minute scales.

+ + Pappus none.

Carpesium. Flower-heads heterogamous, the female flowers tubular in numerous rows. Achenes many-ribbed, beaked. Herbs.

* * *Female flowers if present filiform.*

× Style-branches of hermaphrodites usually truncate. Flower-heads androgynous or unisexual, or homogamous Involucre-bracts usually scarious, hyaline or petaloid (*Gnaphalieæ*).

+ Flower-heads 1-flowered. Pappus none.

Cæsulia. Flower-heads clustered, axillary, of 2 bracts only, inserted to the broad receptacle and surrounded by a leafy involucre. Aquatic herbs, the leaves simple.

+ + Flower-heads many-flowered.

† Flower-heads androgynous, usually with more female than hermaphrodite florets, or more or less unisexual, diœcious or monœcious, clustered or distinct. Involucre-bracts rarely petaloid.

O Hermaphrodite florets all sterile, the style usually entire or scarcely and only very shortly 2-cleft.

Antennaria. Flower-heads strictly diœcious, in dense corymbs or rarely solitary. Bristles of pappus united at the base into a ring. Inflorescence not involucred.

Leontopodium. Flower-heads unisexual or androgynous, monœcious or incompletely diœcious, clustered or in dense cymes. Bristles of pappus united at the base into a ring. Inflorescence involucred by the floral leaves.

Anaphalis. Flower-heads androgynous or incompletely diœcious, in corymbs, rarely few or solitary. Bristles of pappus free from the base. Inflorescence not involucred.

O O Most or all hermaphrodite florets fertile. Style deeply 2-cleft.

Gnaphalium. Flower-heads more or less androgynous, usually small and clustered, rarely solitary, the involucral bracts scarious, often coloured. Ray-florets very numerous, disk-florets few. Bristles of pappus not feathery, free or united at the base into a ring.

† † Flower-heads androgynous with usually fewer female than hermaphrodite florets, or homogamous with the florets all hermaphrodite. Involucre-bracts usually scarious.

Helichrysum. Flower-heads in corymbs, or rarely solitary, the involucral bracts almost all or the inner ones or their laminæ opaquely scarious or petal-like. Achenes not beaked. Bristles of pappus smooth, rough or minutely bearded, rarely feathery towards the end.

× × Style-branches of hermaphrodite flowers not truncate, filiform. Flower-heads androgynous.

+ Female florets supported or enveloped by the scales of the receptacle or by the involucre-bracts.

Athroisma. Flower-heads in dense terminal solitary clusters or short spikes. Female florets subtended by the scales of the receptacle. Achenes broad, dorsally compressed, ciliate on the margins. Scales of pappus very short, united into a ciliate-fringed ring. Herbs, the leaves pinnatisect.

+ + Receptacle naked. Involucral bracts herbaceous, or scarious, linear.

† Flower-heads small, packed into dense globose or ovoid clusters.

Sphæranthus. Flower-heads in solitary terminal globular clusters. Pappus none. Anthers without tails or points at the base.

Pterocaulon. Flower-heads sessile, in spiked clusters or rarely solitary. Pappus of capillary bristles. Anthers with short tails or points at the base.

† † Flower-heads separate, solitary, corymbose or panicled, rarely clustered.

O Pappus of a few rigid bristles or scales, or none.

Epaltes. Involucre-bracts rigid. Anthers with simple tails. Pappus of the female florets none, of the sterile disk-florets small.

O O Pappus consisting of copious capillary soft bristles or hairs.

Blumea. Flower-heads racemose, spiked or panicled. Style of the disk-florets all 2-cleft. Involucre bracts narrow-linear, herbaceous or thin scarious. Herbs, rarely shrubs.

Pluchea. Flower-heads corymbose. Some or all of the disk-florets sterile, with a simple style. Involucral bracts rigid, often broad. Shrubs or undershrubs.

O O Anther-base obtuse, or only mucronate or acute, but not tailed.

Subtrib. 6. *ASTEROIDEÆ.* Flower-head heterogamous radiate or discoid or homogamous in absence of the ray-florets. Involucre-bracts in several or rarely only 2 rows. Anthers with obtuse almost entire base. Style-branches linear, more or less flattened, produced beyond the stigmatic lines into lips or appendages, papillose on the outside. Receptacle usually naked. Leaves usually alternate.

* *Female florets if present filiform or bell-shaped or 2-toothed.*

× Female florets if present filiform. Pappus bristly (*Conyzeæ*).

Microglossa. Female florets in 1 or several rows with the corollas minutely ligulate, those on the disk fertile. Pappus bristles elongate. Involucre-bracts in many rows. Shrubs.

Conyza. Female florets in many rows with the corollas shortly filiform (rarely slightly and minutely ligulate), the hermaphrodite florets mostly fertile. Achenes compressed. Pappus-bristles elongate. Involucre-bracts in 2 to many rows. Herbs or undershrubs.

Thespis. Female florets in 2 to many rows, destitute of a corolla, the hermaphrodite florets sterile. Pappus-bristles short, somewhat dilated at the base. Herbs.

× × Female florets in 2 or more rows not exceeding the disk, 2-toothed at the apex or bell-shaped. Herbs. (*Grangineæ*).

Cyathocline. Receptacle almost contracted around the margin, raised, the disk concave. Achenes not beaked, compressed, bordered with a marginal nerve. Flower-heads panicled.

Grangea. Receptacle convex or conical, naked. Achenes produced into a ring or neck toothed or almost bristly on the margins. Flower-heads solitary.

Dichrocephala. Receptacle almost contracted around the raised margin, the disk almost flat. Style-branches of the disk-florets acute. Achenes not beaked, compressed, bordered by a nerve. Flower-heads racemose or panicled.

* * *Female florets if present ligulate.*

× Ligulate female florets not yellow (white or rose-coloured to purple).

+ Pappus none or very short (*Bellideæ*).

MYRIACTIS. Involucre broad, the narrow bracts in few rows. Ligules in 2 or more rows, small. Achenes not or very shortly beaked, oily. Pappus none.

RHYNCHOSPERMUM. Involucre-bracts in few rows, imbricate. Ligules in 2 or more rows, short and broad. Achenes beaked. Pappus of a few very caducous bristles or none.

+ + Pappus of elongate bristles, rarely short and paleaceous or awned (*Heterochromæ*).

† Pappus consisting of very short bristles, scales, or awns, or absent in the ray-achenes.

BOLTONIA. Receptacle conical or convex. Bristles of pappus very short, almost paleaceous, often accompanied by 2—4 awns not exceeding the achene.

† † Pappus consisting of copious capillary bristles in a single or more rows (rarely depauperate in the ray-achenes).

‡ Ligules usually rather broad or ample.

CALLISTEPHUS. Involucre hemispherical, the outer bracts leafy, the inner ones membranously scarious. Achenes compressed. Outer bristles of pappus very short and forming a small crown.

ASTER. Involucre bell-shaped or hemispherical, the bracts in many rows, not or leafy appendaged, or squarrose, or with scarious margins, or herbaceous and in only 2 rows. Bristles of pappus in several to 2 rows, equal. Achenes usually much compressed.

‡ ‡ Ligules usually numerous, in 2 or more rows, narrow or almost filiform or minute.

ERIGERON. Involucral bracts nearly in 2 rows, narrow, somewhat unequal. Achenes compressed. Bristles of pappus in a single row, or with a few very short outer ones.

× × Ligulate female florets (like the disk-florets) yellow. (*Homochromæ*).

SOLIDAGO. Ray-florets few. Involucre narrow, rather wide. Appendage of the style-branches usually lanceolate. Achenes obovoid or oblong. Bristles of pappus capillary, copious, somewhat unequal. Shrubs or undershrubs.

Subtrib. 7. *SENECIONIDEÆ.* Flower-heads either heterogamous, with the female florets ligulate or rarely filiform, or sometimes homogamous, with all the florets hermaphrodite and tubular. Receptacle usually naked. Involucre-bracts usually in a single row, with or without outer small ones, rarely in several rows and imbricate. Anthers obtuse or shortly 2-mucronate at the base. Style-branches of the hermaphrodites truncate and penicillate, or rarely with pubescent tips or appendages. Pappus of capillary bristles. Leaves alternate.

* *Involucre wide, the bracts membranous or herbaceous, elongate or acuminate.*

DORONICUM. Flower-heads radiate. Involucre-bracts in 2 rows, equal, herbaceous, acuminate. Receptacle hemispherical. Herbs.

* * *Involucre-bracts narrow, stiff, usually ribbed or keeled.*

× Flower-heads heterogamous, discoid, the outer female florets filiform, shorter than their style.

ERECHTHITES. Involucre etc. of *Senecio*. Female florets in 2 or more rows, the outer ones filiform. Flower-heads usually narrow, corymbose. Herbs.

× × Flower-heads radiate or homogamous. Bristles of pappus not feathery.

Gynura. Flower-heads homogamous. Style-branches terminating in an elongate shortly hairy subulate appendage. Rest as in *Senecio*. Herbs, often tuberous-rooted.

Emilia. Flower-heads homogamous. Style-branches terminating in a short or rather long appendage. Rest as in *Senecio*. Herbs.

Notonia. Flower-heads homogamous. Style-branches of hermaphrodites terminating in an ovate appendage. Rest as in *Senecio*. Fleshy glaucous herbs.

Senecio. Flower-heads radiate or homogamous. Involucre wide or narrow, the bracts narrow, equal, blunt or shortly pointed, the outer ones small or wanting, or rarely gradually longer from below. Style-branches truncate or obtuse, or rarely shortly appendaged. Achenes 5—10-ribbed. Herbs or rarely shrubs, the leaves alternate or radical.

* * *Flower-heads homogamous, all the florets regularly tubular, never yellow (usually purple, violet, or white).*

Subtrib. 8. *EUPATORIACEÆ.* Anther-base nearly entire. Style-branches almost terete or very elongate-club-shaped, obtuse, only minutely papillose. Leaves opposite or alternate.

* *Anthers appendaged at the tip. Achenes 5-ribbed* (Agerateæ).

× Bristles of pappus copious, smooth or minutely hairy.

Eupatorium. Involucre-bracts in several, rarely in 2—3 rows, somewhat unequal, always more than 5. Flower-heads usually many (rarely 1—4) flowered, corymbose or panicled.

Mikania. Involucre-bracts 4 only, somewhat unequal. Flower-heads 4-flowered, racemose or panicled. Twining shrubs.

× × Pappus entirely or partially chaffy or awned, or consisting of 5—10 rigid bristles, or minute and coronate, or none.

Ageratum. Involucre-bracts in 2—3 rows, somewhat unequal. Pappus of 5 short scales or long awns free or united into a shagged crown, or of 10—20 stiff bristles chaffy or dilated at the base. Herbs.

* * *Anthers truncate at the top and not appendaged. Achenes 5-ribbed.*

Adenostemma. Involucre-bracts numerous, almost in 2 rows, somewhat unequal. Pappus of 3—5 short stiff spreading bristles usually gland-tipped. Herbs.

Subtrib. 9. *VERNONIACEÆ.* Anther-base sagittate. Style-branches subulate, shortly hairy all over. Leaves usually alternate.

* *Flower-heads small, sessile, usually* 1- *or few-flowered, packed into a head-like cluster.* (Lychnophoreæ).

Elephantopus. Florets slightly irregular, by 2—5 in a head. Involucre-bracts usually 8, in 2 rows. Bristles or scales of pappus rigid, in 1 or 2 rows. Flower-heads clustered, the clusters leafy-involucred. Herbs.

* * *Flower-heads separate, usually peduncled and in more or less lax inflorescences.* (Vernonieæ).

× Pappus none or more usually composed of a few very caducous bristles.

Ethulia. Involucre bell-shaped, not leafy. Flower-heads small, corymbose. Achenes 4—5-cornered, broadly truncate at the top. Pappus none. Herbs.

Centratherum. Involucre wide, the outer bracts leafy or rarely only shortly leafy-appendaged. Flower-heads corymbose or solitary. Pappus of a few or numerous bristles. Herbs.

× × Pappus more or less persistent, composed of numerous capillary bristles in 2—3 rows, those of the outer row sometimes very short or reduced to scalelets.

VERNONIA. Flower-heads various, the bracts in many rows, scarious or the outer ones sometimes leafy-appendaged. Receptacle naked or areolate. Achenes 10-ribbed or 4—5-cornered. Outer pappus as long as the inner, or shorter, very short, or none. Shrubs or herbs.

Trib. II. CYNAROCEPHALÆ, Vaill. Florets either regular and tubular with the style usually thickened joint-like near or at the apex, or bilabiate with the styles various. Herbs, rarely shrubs, not aromatic. Anther-base usually tailed or fringed.

Subtrib. 10. *CYNAROIDEÆ.* Flower-heads discoid, the florets all tubular and regular or nearly so, hermaphrodite, the lobes usually narrow. Anthers usually fringed or tailed at the base. Style usually thickened joint-like at or below the division into branches, which latter are narrow and obtuse, or slightly pointed and often erect. Leaves alternate, often spiny.

* *Flower-heads usually many-flowered, separate.*

× Achenes usually glabrous, seated in the very oblique or lateral areoles of the receptacle. (*Centaureæ.*)

+ Involucre without floral leaves or outer leafy bracts.

TRICHOLEPIS. Involucre-bracts narrow, awned-acuminate, entire, not appendaged. Filaments shortly papillose-pilose. Anthers with rather long shaggy tails. Style-branches thin. Achenes glabrous, obtusely cornered or compressed. Leaves unarmed.

+ + Involucre surrounded by spiny-toothed floral leaves or outer leafy bracts.

CARTHAMUS. Outer involucral bracts with a large leafy appendage, inner ones spiny-pointed. Florets orange. Pappus none, or paleaceous. Achenes compressed or obtusely cornered. Leaves spiny-armed.

× × Achenes usually glabrous, seated in the straight areoles of the receptacle. (*Carduineæ*).

+ Filaments papillose-pilose, free. Bristles of pappus united at the base into a ring and both deciduous.

CNICUS. Outer involucre bracts usually spiny armed, the innermost ones often unarmed. Receptacle densely covered with rigid bristles often longer than the achenes themselves. Bristles of pappus feathery or shortly bearded. Leaves spiny-armed.

+ + Filaments glabrous, free.

SAUSSUREA. Involucre not prickly. Pappus of numerous feathery bristles in a single row with or without a few simple ones outside. Receptacle with bristles between the florets. Leaves not armed.

* * *Flower-heads 1-flowered, packed into dense spherical heads. Achenes inserted in the straight areoles of the receptacle, silky-villous* (Echinopsidæ).

ECHINOPS. Leaves and involucres spiny-armed. Thistle-like herbs.

Subtrib. 11. *MUTISIACEÆ.* Flower-heads either heterogamous, with radiating female florets, or homogamous, with the florets all hermaphrodite and tubular, in both cases some or all of the outer florets more or less 2-lipped. Anthers with pointed tailed base. Style not or slightly thickened joint-like at the apex, the branches very short or elongate, rounded or truncate at the tips, not appendaged. Pappus bristly, paleaceous or rarely absent. Leaves radical or alternate, rarely opposite.

* *Flower-heads homogamous, the corollas tubular with the segments of limb narrow, equal or almost 2-lipped.* (Gochnatieæ).

× Flower-heads usually many-flowered.

Dicoma. Flower-heads usually almost sessile. Style-branches linear, long or shortened. Achenes densely villous. Scales or bristles of the pappus feathery, copious. Herbs.

× × Flower-heads few-flowered.

Leucomeris. Receptacle naked. Style-branches very short, conniving or almost spreadiug. Achenes oblong, silky-villous. Bristles of pappus smooth. Flower-heads corymbose. Shrubs or small trees.

Ainsliæa. Style-branches very short. Bristles of pappus feathery. Flower-heads 2—5-flowered, sessile or peduncled, racemose or panicled. Herbs.

* * *Flower-heads usually radiate, the corollas ligulate-2-lipped, rarely ligulate* (Gerbereæ).

Gerbera. Involucre turbinate or bell-shaped, the bracts unequal, imbricate. Ray-florets in 1 or 2 rows, 2-lipped, the ligules 3—4-nerved. Achenes usually beaked. Pappus reddish. Herbs, the leaves radical.

Subord. II. CICHORIACEÆ, Juss. Flower-heads homogamous, all the florets ligulate and hermaphrodite. Style not thickened at the apex, the branches filiform, revolute, and puberulous. Herbs, tall or small, never woody, with fistulose stems, the sap always milky.

* *Pappus paleaceous, awned, coronate or none.*

Subtrib. 1. *HYOSERIDEÆ.* Involucre various. Achenes truncate at the top. Pappus consisting more or less of small scales or scalelets alternating with bristles, or none.

Cichorium. Inner involucre-bracts in 1—2 rows, almost equal, erect, the outer ones short, lax or wanting. Pappus none or very minute. Florets large, blue. Rigid branched herbs.

* * *Bristles of pappus (at least those of the central achenes) capillary, smooth or feathery.*

Subtrib. 2. *CREPIDEÆ.* Involucre calyx-like or rarely imbricate. Achenes contracted at the base, rarely columnar. Herbs.

* *Hairs of indument simple. Innermost bracts of the involucre usually thickening at the base.* (Crepideæ).

Crepis. Involucre of a single row of nearly equal bracts, with a few small outer ones. Achenes not at all or scarcely flattened, very shortly contracted at the top. Pappus sessile, of numerous simple capillary bristles or hairs. Herbs with leafy stems.

Picris. Outer involucre-bracts small, numerous. Achenes very shortly contracted at the top. Pappus (at least of the central achenes) consisting of feathery bristles. Hispid herbs, with leafy stems.

* * *Hairs of indumentum (if present) stellate often accompanied by simple ones, or the indument intricately woolly. Innermost bracts of the involucre not thickening.* (Hieracieae.)

Hieracium. Receptacle naked or very shortly fibrillose. Bristles of the pappus rather stiff, fragile, persistent, simple. Herbs.

Subtrib. 3. *LACTUCACEÆ.* Involucre calyx-like or rarely imbricate. Achenes contracted at both ends, or beaked. Bristles of pappus simple. Herbs; the hairs if present simple.

* *Achenes shortly or long-beaked.*

Lactuca. Achenes more or less compressed, ribbed. Bristles of pappus persistent or deciduous. Florets yellow or blue.

* * *Achenes not beaked.*

Prenanthes. Achenes almost terete or somewhat compressed, bluntish 3—5-cornered, not or scarcely ribbed. Bristles of pappus more or less persistent. Florets purple to white, never yellow.

Sonchus. Achenes more or less compressed, ribbed. Bristles of pappus soft, white, at base united into a ring and deciduous with it. Involucral bracts often incrassate-dilated in fruit. Florets yellow.

Microrhynchus. Achenes columnar, truncate at both ends, bluntly 4—5-ribbed, sometimes narrowly 2—3-winged. Florets yellow.

Xanthium, L.

1. X. strumarium, L. sp. pl. 1400 DC. Prod. V. 524; Bth. Fl. Hongk. 181; Clark. Comp. Ind. 132. (*X. Indicum*, Roxb. Fl. Ind. III. 601; DC. Prod. V. 523; Wight Icon. t. 1104; Griff. Not. Dicot. 232; *X. Roxburghii*, Wallr. Beitr. Bot. I. 233; Walp. Rep. VI. 151; *X. discolor*, Wallr. l. c.; Walp. l. c.; *X. brevirostre*, Wallr. l. c.; Walp. l. c.; *X. inaequilaterum*, DC. Prod. V. 523; Wallr. Beitr. Bot. 232; Walp. Rep. VI. 151).

Hab. Frequent in rubbishy or waste places, along river-banks, etc., not only in the mixed forests, but more so in and around villages, all over Burma from Chittagong and Ava down to Tenasserim.—Fl. Fr. C. and HS.

Tridax, L.

*1. T. procumbens, L. sp. pl. ed. 1. 900; DC. Prod. V. 679; Clark. Comp. Ind. 142.

Hab. A weed like wild on old walls, in rubbishy places, etc., common about Chittagong; less so about Akyab in Arracan, and in Rangoon, and probably around other seaports, but not yet spread over the country as in India.—Fl. Fr. ∞.

Synedrella, Gærtn.

*1. S. nodiflora, Gærtn. Fruct. II. 456. t. 171; DC. Prod. V. 629; Clark. Comp. Ind. 139. (*Verbesina nodiflora*, L. Amoen. IV. 290).

Hab. Rubbishy places and neglected garden land in and around villages, rather frequent about Akyab, Arracan; Upper-Tenasserim, Moulmein (Dr. Stoliczka); on the Andamans now very common and penetrating to the clearings in the jungles.—Fl. Oct.—March; Fr. Febr.—May.

Cosmos, Cav.

Conspectus of Species.

Florets all purple to rose-coloured; achenes long and slenderly beaked, the beak terminated by 2 stiff awn-like bristles, ... *C. caudatus.*

Florets all yellow; achenes long but thickly beaked, the beak without pappus-bristles, .. *C. sulfureus.*

*1. C. CAUDATUS, H. B. K. Nov. gen. Amer. IV. 240; DC. Prod. V. 606; Griseb. Fl. West. Ind. 373.

HAB. As wild in neglected lands in and around Rangoon.—Fl. Nov., Dec.

*2. C. SULFUREUS, Cav. Icon. I. 56. t. 79; DC. Prod. V. 606; Griseb. Fl. West. Ind. 373. (*Coreopsis artemisiæfolia*, Jacq. Icon. III. t. 595; *B. calva*, Clark. Comp. Ind. 141; *Adenolepis calva*, Schultz. Bip. in Zoll. Cat. 123; Miq. Fl. Ind. Bat. II. 79).

HAB. Not unfrequent in the savannahs, and in rubbishy places near villages, about Akyab in Arracan, and in similar places in Rangoon up the valley as far as Phoungyee.—Fl. Nov.—Feb.

I am not at all sure whether the above synonymy is correct. The same plant (*Adenolepis calva*) has become quite a nuisance about Buitenzorg and other places in Java, entering freely the hill-savannahs.

Bidens, L.

Conspectus of Species.

Subg. 1. *Platycarpæa.* Achenes flat and rather broad.

Leaves divided into 3 lanceolate serrate segments, or pinnatifid, ... *B. tripartita.*

Subg. 2. *Psilocarpæa.* Achenes slender, 4-cornered.

Leaves mostly pinnately 4—3-foliolate. Ray-florets white, ... *B. pilosa.*

Leaves mostly bipinnate. Ray yellow. Slender dry herb, ... *B. bipinnata.*

1. B. PILOSA, L. sp. pl. 1166; DC. Prod. V. 597; Clark. Comp. 141 quoad var. *a* (*B. leucantha*, Willd. sp. pl. III. 1282; DC. Prod. V. 598; *B. Sundaica*, Bl. Bydr. 913; DC. Prod. V. 598).

HAB. Here and there springing up in deserted hill-toungyas and in betel-nut gardens of the Martaban hills east of Toughoo, at 2—4000 ft. elevation; apparently more frequent in the northern hilly parts of Ava.—Fl. Fr. Sept.—March.

2. B. BIPINNATA, L. sp. pl. 1166; Roxb. Fl. Ind. III. 411; DC. Prod. V. 603; Bth. Fl. Austr. IV. 543. (*B. Wallichii*, DC. Prod. V. 598; *B. pilosa*, var. *β. Wallichii*, Clark. Comp. Ind. 141).

HAB. Tenasserim, Tavoy (Wall.). Fl. July—Oct.

Siegesbeckia, L.

1. S. ORIENTALIS, L. sp. pl. 1269; Roxb. Fl. Ind. III. 432; DC. Prod. V. 495; Bth. Fl. Hongk. 182 and Fl. Austr. IV. 535; Wight Icon. t. 1103; Clark. Comp. Ind. 133. (*S. brachiata*, Roxb. Fl. Ind. III. 432).

HAB. Here and there in deserted toungyas, but more frequent in the drier hill-forests of Martaban, at 2000—7100 ft. elevation; also Ava, Bhamo.—Fr. Jan.—March.

Enhydra, Lour.

1. E. FLUCTUANS, Lour. Fl. Coch. II. 625; DC. Prod. V. 637. (*E. Heloncha*, DC. Prod. V. 637; Clark. Comp. Ind. 133; *E. paludosa*, DC. l. c.; Bth. Fl. Austr. IV. 546; *E. longifolia*, DC. l. c.; *Hingtsha repens*, Roxb. Fl. Ind. III. 448).

HAB. Not unfrequent in swamps and swampy grass-lands of the cultivated plains of Pegu and Arracan, and probably all over the country; also Ava, Bhamo.—Fl. Fr. CS.

Eclipta, L.

1. E. ALBA, Hassk. Pl. Jav. rar. 528; Miq. Fl. Ind. Bat. II. 65; Bth. Fl. Hongk. 181 and Fl. Austr. IV. 536; Clark. Comp. Ind. 134. (*E. erecta*, L. Mant. 286; DC. Prod V. 490; *Verbesina alba*, L. sp. pl. 1272; *E. longifolia*, Schrad. ap. DC. Prod. V. 490).

Var. α. ERECTA, Miq. Fl. Ind. Bat. II. 65; Clark. l. c.; more or less erect and appressed hispid; peduncles elongate, $\frac{3}{4}$—2 in. long.

Var. β. PROSTRATA, Miq. l. c.; Clark l. c. (*E. prostrata*, L. Mant. 286; Roxb. Fl. Ind. III. 438; DC. Prod V. 490; *E. parviflora*, Wall. in. DC. l. c.; *E. thermalis*, Bung. Enum. Pl. Chin. bor. No. 224; DC. l. c.; *E. procumbens*, Michx. Flor. Bor. Amer. II. 129; DC. l. c. 491; *E. brachypoda*, Mchx. l. c. 130; DC. l. c. 491), more or less prostrate, appressed hirsute; flower-heads shortly peduncled.

Var. γ. ZIPPELIANA, Miq. l. c.; Clark. l. c. (*E. Zippeliana*, Bl. Bydr. 914; DC. Prod. V. 490; *E. hirsuta*, Bartl. in Linn. XIII. Litt. Ber. 95), erect or spreading, more robust in all parts, spreadingly hirsute; flower-heads shortly petioled.

HAB. Var. α. and β. common in waste and in cultivated lands, along roadsides, ruined pagodas, etc., not only in the leaf-shedding forests, but more so in the cultivated plains, all over Burma, from Chittagong and Ava down to Tenasserim; also on the Andamans (here introduced, but rapidly spreading); var. γ. along the banks of the Irawaddi in the Prome District.—Fl. Fr. C. and H. S.

Wedelia, Jacq.

Conspectus of Species.

* *Some of the outer involucral bracts more leaf-like and longer than the others. Pappus cup-shaped.*

Flower-heads on very elongate peduncles, always solitary; leaves oblong to lanceolate, almost sessile or narrowed into a short petiole, ... *W. calendulacea.*

Flower-heads rather short-peduncled, usually by pairs or few, axillary, terminal and in the fork of the branchings; leaves ovate to ovate-lanceolate, slenderly petioled, .. *W. urticifolia.*

* * *Outer involucre-bracts not longer than the inner ones. Pappus none or of 2 or 1 deciduous bristles. Flower-heads longer or shorter peduncled, by 2—3 or few, axillary, terminal, and in the branch-forkings.*

Straggling perennial; leaves ovate or broadly ovate-lanceolate, ... *W. biflora.*
Erect, coarse annual; leaves lanceolate, ... *W. asperrima.*

1. W. CALENDULACEA, Less. Syn. 222, non Rich.; DC. Prod. V. 539; Wight Icon. t. 1107; Bth. Fl. Hongk. 182 and Fl. Austr. IV. 537; Clark. Comp. Ind. 136. (*Verbesina calendulacea*, L. sp. pl. 1272; Roxb. Fl. Ind. III. 440).

HAB. Frequent in the tidal forests and along river-banks as high up as the tidal waves, all along the coast from Chittagong and Arracan down to Tenasserim.—Fl. RS.

2. W. URTICIFOLIA, DC. in Wight Contr. 18 and Prod. V. 539; Wight Icon. t. 1106. Bth. Fl. Austr. IV. 538. (*W. biflora*, Clark. Comp. Ind. 137. excl. syn. sub. α.; *Verbesina biflora*, Roxb. Fl. Ind. III. 440, non L.)

HAB. Prome hills (Wall.).—Fl. Fr. Sept., Oct.

3. W. BIFLORA, DC. in Wight Contr. 18; Bth. Fl. Austr. IV. 539. (*Verbesina biflora*, L. sp. pl. 1272, non Roxb.; *Wollastonia biflora*, DC. Prod. V. 546; Wight Icon. t. 1108. Bth. Fl. Hongk. 183 excl. syn. ?; *W. scandens*, Clark. Comp. Ind. 136; *Verbesina scandens*, Roxb. Fl. Ind. III. 401; *Wollastonia insularis*, DC. Prod. V. 548; *Wollastonia Horsfieldiana*, Miq. Fl. Ind. Bat. II. 72).

HAB. Frequent in the tidal, and more especially in the beach-forests, all along the coasts from Chittagong down to Tenasserim and the Andamans.—Fl. Fr. ∞.

Tithonia, Desf.

*1. T. TAGETIFLORA, Desf. Ann. Mus. I. 46. t. 4; DC. Prod. V. 584; Bot. Reg. t. 591.

HAB. Upper Tenasserim, Attaran (Dr. Brandis), no doubt only an escape from cultivation.

Spilanthes, L.

Conspectus of Species.

Prostrate or ascending, branched; flower-heads solitary in the leaf-axils or in the forks of the branches, ... *S. Acmella.*
Erect, simple-stemmed; flower-heads panicled, ... *S. paniculata.*

1. S. ACMELLA, L. Syst. Veg. 610; Roxb. Fl. Ind. III. 410; DC. Prod. V. 623; Clark. Comp. Ind. 138 excl. var. δ.

Var. α. ACMELLA, Clark. l. c. (*Sp. calva* Wight Icon. t. 1109), achenes marginate, with the borders bristly-rough, usually crowned by 1 or 2 bristles.

Var. β. CALVA, Clark. l. c. (*Sp. calva*, DC. in Wight Contr. 19; DC. Prod. V. 625; S. pseudo-acmella, L. syst. veg. 610; DC. l. c.), achenes not or scarcely marginate and smooth on the margins; pappus usually obsolete.

Var. γ. OLERACEA, Clark. l. c. (*S. oleracea*, Jacq. Hort. Vind. II. t.

135; Roxb. Fl. Ind. III. 410; DC. Prod. V. 524), all parts more robust, the flower-heads more than twice the size and often solitary at the ends of the branchlets.

Hab. Var. α. common in waste and rubbishy places in and around villages, on road-sides, fallow fields, and toungyas, along river-banks, etc., not only in all leaf-shedding forests but more so in the cultivated tracts, up to 3000 ft. elevation.—Fl. Fr. C. and HS.

2. S. PANICULATA, Wall. Cat. 3186; DC. Prod. V. 625. (*S. acmella var. δ. paniculata*, Clark. Comp. Ind. 139).

Hab. Frequent in the mixed forests, and more so as a weed in toungyas, poonzohs, and other cultivated and waste lands in and around villages from Pegu and Martaban down to Upper Tenasserim.—Fl. CS.; Fr. C. and HS.

In my eyes a very distinct species. It is the ein-bee-zat of the Burmese, used for poisoning fish.

Tagetes, L.

Conspectus of Species.

Peduncles elongate and almost cylindrical; involucral bracts plain, ... *T. patula.*
Peduncles elongate, much swollen at the apex; involucral bracts almost angular *T. erecta.*

*1. T. PATULA, L. sp. pl. 1249; DC. Prod. V. 643; Sims. Bot. Mag. t. 150; Clark. Comp. Ind. 142.

Hab. Frequently cultivated not only by the Burmese but also by the Karens, and often seen springing up in recently abandoned toungyas.—Fl. CS.

*2. T. ERECTA, L. sp. pl. 1249; Roxb. Fl. Ind. III. 435; DC. Prod. V. 643; Clark. Comp. Ind. 143.

Hab. With the preceding, but less frequently seen.—Fl. CS.

Chrysanthemum, L.

Conspectus of Species.

Subg. 1. *Eu-Chrysanthemum.* Achenes of the ray almost triquetrous, the inner nerve produced at the apex into a tooth. Pappus scarcely any.

Flower-heads large, on long terminal or almost terminal peduncles; ray yellow, ... *C. coronarium.*

Subg. 2. *Pyrethrum.* Achenes oblong, irregularly 3—5-cornered. Pappus scarcely any.

Flower-heads numerous, on slender peduncles, in terminal corymbs; rays yellow, or in garden varieties variously (purple to white and orange) coloured, ... *C. Indicum.*

*1. CH. CORONARIUM, L. sp. pl. 1254; DC. Prod. VI. 64; Clark. Comp. Ind. 146. (*Ch. Roxburghii*, Desf. Cat. Hort. Par. ed. 3. 170; Bot. Mag. t. 1521; DC. Prod. VI. 64; *Pyrethrum Indicum*, Roxb. Fl. Ind. III. 436; Sims. Bot. Mag. t. 152).

HAB. Much cultivated in native gardens, especially in the drier districts, as Prome; also Ava.—Fl. HS.

*2. CH. INDICUM, L. sp. pl. 1253; Roxb. Fl. Ind. III. 436; Bot. Reg. t. 1287 and 1502 (fl. plen.); Bot. Mag. t. 2556; Clark. Comp. Ind. 147. (*Pyrethrum Indicum*, Cass. Doct. XLIV. 149, non. Roxb.; DC. Prod. VI. 62; *Chrysanth. tripartitum*, Sweet Fl. Gard. t. 193; *Ch. Chinese*, Sab. in Trans. Hort. Soc. Lond. IV. 330. t. 14; *Pyrethrum Sinense*, DC. Prod. VI. 62; Bot. Mag. t. 327 and 2042; Bot. Reg. t. 4. 445 and 616).

HAB. Ava, Taongdong (Wall.), probably cultivated.

Artemisia, L.

Conspectus of Species.

Sect. 1. *Dracunculus.* Flower-heads heterogamous, the ray-florets in a single row and female, the disk-florets bisexual but sterile by abortion of the ovaries.

More or less glabrous, the lower leaves simple, obovate-oblong, toothed at the apex, ..*A. parviflora.*

Sect. 2. *Abrotanum.* Flower-heads heterogamous, the ray-florets female, the disk-florets hermaphrodite: all fertile.

Leaves once or twice bipinnatifid, the segments rather broad and elongate, more or less greyish or silky-villose beneath; flower-heads in large panicles, ...*A. vulgaris.*

Leaves twice or thrice bipinnatifid, glabrous, the segments almost filiform, acute; flower-heads rather large, in loose panicles, ...*A. carvifolia.*

1. A. PARVIFLORA, Roxb. Fl. Ind. III. 420; DC. Prod. VI. 100; Clark. Comp. Ind. 159. (*A. glabrata*, Wall. Cat. 413; DC. Prod. VI. 100; Wight Icon. t. 1111).

HAB. Martaban, on the Nattoung hill (Rev. F. Mason); Ava hills east of Bhamo.

2. A. VULGARIS, L. sp. pl. 1188; Engl. Bot. t. 978; Roxb. Fl. Ind. III. 420; Fl. Dan. t. VII. t. 1176; Hayne Arzn. Gew. II. 12; DC. Prod. VI. 112; Clark. Comp. Ind. 161. (*A. leptostachya*, DC. Prod. VI. 113).

Var. *α.* VULGARIS, Clark. Comp. Ind. 161, leaves beneath white-tomentose, the segments usually sharply serrate and laciniate; young flower-heads often woolly-villous.

Var. *β.* INDICA, Clark. Comp. 162 (*A. Indica*, Willd. sp. pl. III. 1846; DC. Prod. VI. 114; Wight Icon. t. 1112; *A. dubia*, Wall. Cat. 3307; DC. l. c. 110), leaves usually green or greyish and little pubescent; flower-heads lax and remote, adult nearly glabrous, often on short capillary peduncles.

HAB. Var. *α.* Karenee hills (O'Riley, Rev. F. Mason); Ava, Khakyen hills (J. Anderson); var. *β.* Ava, Khakyen hills, Taong-dong, etc.—Fl. Febr.—March.

3. A. CARVIFOLIA, Roxb. Fl. Ind. III. 422, err. typ. carnifolia; DC. Prod. VI. 119; Clark. Comp. Ind. 162.

HAB. Prome, banks of the Irrawaddi near Meaday (R. Scott).—Fl. Apr.

Cotula, L.

1. C. ANTHEMOIDES, L. sp. pl. 1256; DC. Prod. VI. 78; Bth. Fl. Hongk. 185; Clark. Comp. 149. (*Pleiogyne anthemoides*, C. Koch in Bot. Ztg. 1843. col. 40; *Pleiogyne cardiosperma*, Edg. in Linn. Trans. XX. 71).

Var. α. GENUINA, achenes winged.

Var. β. HEMISPHERICA, (*Machlis hemispherica*, DC. in Deless. Icon. Select. IV. t. 50; and Prod. VI. 140; Artemisia hemispherica, Roxb. Fl. Ind. III. 422; *Cotula hemispherica*, Wall. Cat. 3236; Clark. Comp. Ind. 150), achenes not winged.

HAB. Var. α. Ava, Irrawaddi valley near Sway-koo; and Khakyen hills east of Bhamo (J. Anderson); var. β. rather rare on the banks of the Irawaddi in Pegu; Ava, Bhamo (J. Anderson).—Fl. Fr. Jan.—March.

Myriogyne, Less.

1. M. MINUTA, Less. in Linn. VI. 219; DC. Prod. VI. 139; Bth. Fl. Hongk. and Fl. Austr. IV. 553 excl. syn. Lour. (*Cotula minuta*, Forst. Prod. 301; *Centipeda minuta*, Bth. ap. Clark. Comp. Ind. 151; *Artemisia sternutatoria*, Roxb. Fl. Ind. III. 423; *Dichrocephala Schmidii*, Wight Icon. t. 1610; *M. Cunninghamii*, DC. Prod. VI. 139; F. Muell. Pl. Vict. t. 41; *Centipeda Cunninghamii*, A. Braun and Aschers. Ind. Hort. Berol. 1867. 6; *Centipeda orbicularis*, Miq. Fl. Ind. Bat. II. 89, non Lour.; *Sphæromorphæa Russeliana*, DC. in Deless. Icon. sel. IV. t. 49; DC. Prod. VI. 140; *Centipeda minima*, A. Braun. and Aschers. in Ind. Hort. Berol. 1867. 6.; *Cotula*, sp., Griff. Not. Dicot. 237?).

HAB. Frequent in fields, fallow or under cultivation, in wastes and rubbishy places, river-banks, &c., all over Burma, from Chittagong and Ava down to Tenasserim; Andamans, now frequent on rice-fields (originally introduced).—Fl. Jan.—March; Fr. HS.

Centipeda, Lour.

1. C. ORBICULARIS, Lour. Fl. Coch. II. 602; Clark. Comp. Ind. 151. (*Sphæromorphæa? Centipeda*, DC. Prod. VI. 140).

HAB. Adjoining provinces of Siam, in dried up marshes near Radbooree (Teysmann).—Fl. HS.

Inula, L.

Conspectus of Species.

× Stems not winged. Villous or villous-pubescent undershrubs. Bracts of the involucre narrow-linear. Flower-heads corymbose panicled. .. *I. cappa.*

× × Stems leafy-winged from the decurrent sessile leaves. Densely woolly villous tall annuals.

Flower-heads thick, woolly, and rather large, corymbose, the outer involucre-bracts leafy linear-oblong, ... *I. polygonata.*

1. I. CAPPA, DC. Prod. V. 469; Bth. Fl. Hongk. 180; Clark. Comp. Ind. 124. (*I. pseudo-Cappa*, DC. l. c. 469; *I. eriophora*, DC. l. c. 470; *I. salviodora*, Schultz. Bip. in Zoll. Cat. 122; Miq. Fl. Ind. Bat. III. 62; *Duhaldea Chinensis*, DC. Prod. V. 366; *I. oblonga*, DC. Prod. V. 469).

HAB. Common in the drier hills, more especially the pine-forests of Martaban and Upper Tenasserim, up to 4000—5000 ft. elevation, descending into the eng- and hill-eng-forests, where it is not unfrequent; also Ava hills.—Fl. Febr., March; Fr. April, May.

2. I. POLYGONATA, DC. Prod. V. 465; Clark. Comp. 119.

HAB. Common in the eng- and hill-eng-forests all over Prome, Pegu, and Martaban, up to 2000 ft. elevation, most probably also in Ava.—Fl. CS.; Fr. HS.

N. B. *I. Oculus-Christi*, Clark. Comp. Ind. 120, has nothing to do with the Linnean plant, and is *I. obtusifolia*, Kerner Nov. sp. pl. II. 18.

Vicoa, Cass.

Conspectus of Species.

Slender, more or less roughish; leaves short; flower-heads only 2—2½ lin, across, .. *V. Indica.*

More robust, more glabrescent; leaves elongate-linear; flower-heads ½—⅝ in. in diameter, ... *V. appendiculata.*

1. V. INDICA, DC. Prod. V. 474; Wight Icon. t. 1148; Clark. Comp. Ind. 127. (*Inula Indica*, L. sp. pl. 1237; *V. aurita*, DC. l. c.; *V. auriculata*, DC. l. c.; *Doronicum calcaratum*, Roxb. Fl. Ind. III. 434).

HAB. Frequent in the eng and dry forests of the Prome District.—Fl. Jan.—March; Fr. March, April.

2. V. APPENDICULATA, DC. Prod. V. 474; Clark. Comp. Ind. 127.

HAB. Ava, apparently not unfrequent along the Irrawaddi.—Fl. Decb., Jan.

Pulicaria, Gærtn.

1. P. GLAUCESCENS, Clark. Comp. Ind. 130, excl. syn., non Bth.

HAB. Tenasserim (or Andamans?) (Helfer 3176).

Evidently no *Pulicaria*, and certainly not identical with the Persian plant. It looks more like *Pluchea*, but the pappus is different. The material at disposal is defective.

Cæsulia, Roxb.

1. C. AXILLARIS, Roxb. Corom. Pl. I. t. 93 and Fl. Ind. 447; Bot. Rep. t. 431; DC. Prod. V. 482; Wight Icon. t. 1102; Clark. Comp. Ind. 116. (*Meyera orientalis*, Don Prod. Nep. 180).

HAB. Chittagong.

Anaphalis, DC.

Conspectus of Species.

Leaves adnate but not decurrent at the base, 1-nerved; flower-heads peduncled, 3—4 lin. in diameter, corymbose; an adnate-lanate herb, ...*A. Royleana.*

Leaves more or less decurrent at the base, 3-nerved; flower-heads half the size, sessile and clustered, in corymbs; densely white adnate-woolly stout herb, ...*A. adnata.*

1. A. ROYLEANA, DC. Prod. VI. 272; Clark. Comp. Ind. 104.

HAB. Here and there in the hill toungyas of Martaban east of Tounghoo, at about 4—5000 ft elevation; also Ava hills.—Fl. March.

2. A. ADNATA, DC. Prod. VI. 274; Clark. Comp. Ind. 108.

HAB. Frequent in the drier hill-, especially the pine-forests, and on the hill-pastures of the higher ridges of Martaban, from 5400—7100 ft. elevation.—Fl. Nov.—Febr.; Fr. Febr.—March.

Gnaphalium, L.

Conspectus of Species.

* *Flower-heads corymbose, or the corymbs contracted and almost head-like.*

× Leaves linear, with a rounded base half-stem-clasping.

Tall annual; flower-heads laxly corymbose, tha involucral bracts yellow or brown, .. *G. hypoleucum.*

× × Leaves more or less spatulate-linear to cuneate-obovate.

Silky-villous herb much branched from the base; flower-heads densely clustered and forming leafless more or less lax corymbs, the involucre-bracts bright yellow or greyish pale yellow, ... *G. luteo-album.*

Simple or almost simple tender herb, thinly viscid-pilose; leaves obovate-cuneate, almost half-amplexicaul, thinly herbaceous; flower-heads in dense terminal almost head-like corymbs, the involucral bracts almost membranous, often more or less steel-blue coloured, ...*G. flaccidum.*

* * *Flower-heads clustered or rarely solitary in the axils of the leaves and usually gradually passing into a leafy terminal spike or head.*

Erect or spreading from the base, more or less silky-pilose; leaves elongate obovate-cuneate; flower-heads only about a line long, leafy spicate, ... *G. Indicum.*

As preceding, but flower-heads about 2 lin. long, the involucre-bracts firmer, .. *G. purpureum.*

Prostrate and spreading, the branchings only slightly leaved at the lower parts, more so upwards, the upper leaves forming stellate involucres to the densely crowded leafy heads, ... *G. crispatulum.*

1. G. HYPOLEUCUM, DC. in Wight Contr. 21 and Prod. VI. 222; Wight Icon. t. 1114; Bth. Fl. Hongk. 187; Clark. Comp. Ind. 114. (*G. confertum*, Bth. in. Lond. Journ. Bot. I. 488).

HAB. Frequent in the drier hill-, especially the pine-forests, and freely springing up as well in the clearings as on the hill-pastures, of Martaban, at 4000 to 6000 ft. elevation; also Ava-hills.—Fl. Fr. March.

2. G. LUTEO-ALBUM, L. sp. pl. 1198; Engl. Bot. t. 1002; Fl. Dan. t. 1763, DC. Prod. VI. 230; Clark. Comp. Ind. 114. (*G. pallidum*, Lamk.

Dict. II. 750; DC. Prod. VI. 230; *G. confusum*, DC. Prod. VI. 222; *G. multiceps*, Wall. Cat. 8949; DC. Prod. VI. 222; Bth. Fl. Hongk. 188; *G. ramigerum*, DC. Prod. VI. 222; *G. orixense*, Roxb. Fl. Ind. III. 425; *G. Javanicum*, DC. Prod. VI. 222; *G. Reinwardtianum*, Miq. Fl. Ind. Bat. II 91).

HAB. Common in cultivated lands, along river-banks, in deserted toungyas and open waste places, in all leaf-shedding forests, all over Burma and adjacent islands, up to 4000 ft. elevation.—Fl. Fr. Febr.—May.

3. G. FLACCIDUM, Kurz MS.; Clark. Comp. Ind. 115.

HAB. Here and there in light bamboo-jungles (of *Bamb. arundinacea*) in the alluvial lands between the Irrawaddi and Lhein rivers in Pegu. —Fl. Jan.

4. G. INDICUM, L. sp. pl. 1200; DC. Prod. VI. 231; Bth. Fl. Austr. IV. 655; Clark. Comp. Ind. 114. (*G. strictum*, Roxb. Fl. Ind. III. 424; *G. multicaule*, Roxb. Fl. Ind. III. 425; *G. Niliacum*, Raddi in Spreng. Syst. veg. III. 480; DC. Prod. VI. 231).

HAB. Common on fallow fields, along river-banks and roads, in waste places near and around villages, etc. of all the cultivated plains, but also in open somewhat moist or temporarily inundated grounds in all the leaf-shedding, especially the mixed forests, all over Burma, down to Tenasserim. —Fl. Fr. Jan.—May.

5. G. CRISPATULUM, Del. Fl. Aeg. 123 t. 44. f. 3; DC. Prod. VI. 231; Clark. Comp. Ind. 115. (*G. depressum*, Roxb. Fl. Ind. III. 425; *Filago prostrata*, DC. Prod. VI. 249).

HAB. Not unfrequent in temporarily inundated places, in fallow rice-fields and along river-banks of the alluvium of Pegu and Prome.—Fl. CS.

Athroisma, DC.

1. A. LACINIATUM, DC. Prod. V. 369; Clark. Comp. Ind. 98. (*A. viscidum*, Zoll. and Mor. Cat. 122; Miq. Fl. Ind. Bat. II. 35).

HAB. Frequent in dried up river-beds and other temporarily inundated places and on the banks of the larger rivers, as Sittang, Irrawadi, Lhein, etc., of Pegu, Prome, and Martaban; also Tenasserim (Helf. 3127).—Fl. Fr. Jan.—May.

Pterocaulon, Ell.

1. P. BILLARDIERI, F. Muell. Descript. Not. Papuan Pl. III. 43. (*Monenteles spicatus*, Labill. Sert. Nov. Caled. 43. t. 43; DC. Prod. V. 455; *P. cylindrostachyum*, Clark. Comp. Ind. 99).

HAB. Frequent in fallow fields, in neglected culture-land, along river-banks, all over Prome; Ava, along the Irrawaddi, and on Taongdong.—Fl. Fr. Jan.—March.

Sphæranthus, L.

Conspectus of Species.

Subg. 1. *Polycephalos*, Forsk. Outer bracts of the flower-heads longer than the flower-heads themselves, scarious and long-awned.

Glabrous, the branches only slightly winged; heads more oval, sessile, the empty bracts glabrous, ... *S. amarantoides.*

Glandular-puberulous, the branches leafy- and serrate-winged; heads shortly peduncled, the empty bracts appressed bristly and ciliate, ... *S. Peguensis.*

Subg. 2. *Eu-Sphæranthus.* Bracts shorter than the flower-heads and almost entirely hidden by them. Branches leafy-winged.

Pubescent or hirsute; heads globose ½—⅔ in. thick, the involucre-bracts tapering into a subulate ciliate point, ... *S. hirtus.*

Glabrous; heads half the size, the involucre-bracts scarious, often jagged at the ends, .. *S. Indicus.*

1. S. Peguensis, Clark. Comp. Ind. 97.

Hab. Frequent on fallow fields and in waste lands of Prome; probably also Ava.—Fl. March.

I have not seen the Ava specimens of *Sph. amarantoides* referred to by DeCandolle, but suspect they belong to the above species.

2. S. hirtus, Willd. sp. pl. III. 2395; Wight Icon. t. 1094; Clark. Comp. Ind. 97. (*S. mollis*, Roxb. Fl. Ind. III. 546; DC. Prod. V. 369).

Hab. Common in fallow fields, in cultivated or deserted toungyas, along river-banks and similar places, all over Burma, from Chittagong down to Tenasserim.—Fl. November to April; Fr. April, May.

3. S. Indicus, L. Fl. Zeyl. 312; Roxb. Fl. Ind. III. 446. (*S. microcephalus*, Willd. sp. pl. III. 2395; DC. Prod. V. 369; Bth. Fl. Austr. IV. 522; Clark. Comp. Ind. 97).

Hab. Prome district; Upper Tenasserim, Moulmein.—Fl. Sept.—Apr.—Fr. C. and HS.

Epaltes, Cass.

1. E. divaricata, Cass. Bull. philom. 1818. 139; DC. Prod. V. 461; Clark. Comp. Ind. 96. (*Ethulia divaricata*, L. Mant. 110; Burm. Fl. Ind. 176. t. 58. f. 1; (*E. linearifolia*, DC. l. c.; *E. pygmaea*, DC. l. c.).

Hab. Prome hills (Wall).—Fl. Sept., Octob.

Blumea, DC.

Conspectus of Species.

* *Cauline leaves not decurrent on the branches. Florets golden to pale yellow, (except in the white or blue-flowered* B. Wightiana). (Apteræ, DC.)

× Flower-heads on long peduncles arising singly from the axils of the leaves, or rarely appearing compound from the reduction of the leaves.

Shrubby annual; leaves small, sessile with broad base and almost half-stem-clasping; involucre-bracts narrowed into filiform tails; peduncles almost glabrous, ..*B. amplectens.*

Low perennial, branched and ascending from the base, thinly pubescent; peduncles spreadingly pubescent; involucre-bracts very acute; leaves rather large, sessile with a rounded base, ... *B. bifoliata.*

× × Flower-heads in panicles, racemes, or rarely densely packed into shorter or longer spikes.

+ Serratures or teeth of the leaves spiny indurated at their tips.

Spreading perennial, branched from the base and procumbent, sparingly pilose; leaves small, the serratures few and coarse; flower-heads few, forming irregular depauperate panicles, ... *B. oxyodonta.*

Erect, simple or branched annual, more or less appressed silky-pilose; leaves rather large, doubled-spiny-serrulate; flower-heads in regular panicles, ...*B. spinellosa.*

+ + Serratures or teeth of the leaves various, but never spiny-indurated.

† Herbs, or biennials, simple or branched from the base, and more or less villous, pubescent, or viscid-puberulous, rarely almost glabrous.

O Flower-heads irregularly disposed and more or less peduncled, forming panicles or rarely the panicle contracted.

△ Receptacle glabrous.

‡ Florets blue to violet, rarely bluish white.

Tall herb, reduced and small, more or less viscid-pubescent; leaves simple and petioled; flower-heads only 2 lin. long, on shorter or longer filiform peduncles, forming lax panicles, ... *B. Wightiana.*

‡ ‡ Florets all yellow. Flower-heads in lax panicles. Peduncles slender, although sometimes very short. Annuals, rarely becoming biennials.

Erect, branched from the base, more or less silky-villous, but not viscid, the cauline leaves simple and sessile or nearly so; flower-heads 3—3½ lin. long, in panicles sometimes pretty contracted but elongate, ... *B. lacera.*

Erect, branchy, thinly viscid-pubescent, the cauline leaves simple and petioled; flower-heads about 4 lin. long, on long slender glandular peduncles, forming lax panicles, ..*B. glandulosa.*

Erect, branchy, thinly puberulous, the cauline leaves (except in starved states) almost runcinate and petioled; flower-heads about 3 lin. long with the involucral-bracts green and glabrous, on spreading stiff capillary glabrous or glandular peduncles, in lax panicles, ... *B. diffusa.*

Erect, simple or branched, almost glabrous or usually more or less hirsute, the cauline leaves (especially the lower ones) more or less runcinate; flower-heads nearly 4 lin. long, with the involucral-bracts and the long slender peduncles pubescent, in lax panicles, ... *B. lactucæfolia.*

△ △ Receptacle hairy. Peduncles slender.

Branched or simple annual, shortly or rarely glandular-pubescent, the cauline leaves usually runcinate; flower-heads about 3½ lin. long, longer or shorter peduncled, forming lax leafless panicles, ... *B. laciniata.*

O O Flower-heads clustered in the axils of the upper leaves and passing more or less gradually into a contracted spike-like panicle, or crowded in a dense terminal spike, or the sessile clusters remote and in simple or panicled slender spikes.

△ Receptacle hairy. Flower-heads sessile, clustered, or rarely solitary simple or panicled spikes.

Erect, simple or branched annual, slightly or rarely densely pubescent or pilose, the cauline leaves narrow and simple; flower-heads about 3 lin. long, often pilose or almost woolly, ... *B. fistulosa.*

△ △ Receptacle glabrous. Flower-heads more or less peduncled to almost sessile, clustered in the leaf-axils and forming leafy or leafless contracted spike-like panicles or spikes (rarely the panicle developed).

Erect slender annual, long silky-pilose, the leaves all cuneate-oblong to linear; flower-heads silky-pilose, nearly 4 lin. long, on longer or shorter slender peduncles or almost sessile, clustered in the upper leaf-axils and passing into a leafy spike-like contracted panicle, ... *B. barbata.*

Erect robust annual, villous to silky pubescent, the lower stem-leaves more or less spatulate-oblong or linear; flower-heads $\frac{1}{3}$—$\frac{1}{2}$ in. long, on short, thick, woolly-tomentose peduncles or almost sessile, forming dense spikes or spike-like (rarely lax) panicles often accompanied by clusters of flower-heads in the upper leaf-axils, ..*B. hieracifolia.*

† † Erect or scandent shrubs or under-shrubs, or tall shrub-like biennials.

O Erect.

△ Peduncles thick and short, densely tomentose. Leaves more or less villous or tomentose, especially beneath. Receptacle more or less hairy.

Leaves pubescent, especially beneath, decurrent and entire at the base; flower-heads 4 lin long, the involucral bracts narrow, almost glabrous; pappus rufescent; receptacle shortly pilose, ... *B. macrophylla.*

As preceding, but flower-heads larger, the involucral bracts densely pubescent, pappus white, ... *B. procera.*

Leaves silky to silvery villous beneath, with one or two pairs of small dissevered pinnæ on the petiole; flower-heads 4 lin. long, the involucral-bracts densely pubescent; pappus rufescent; receptacle almost glabrous, ... *B. balsamifera.*

△ △ Peduncles long and slender, puberulous to glandular-pubescent. Leaves narrow.

Glandular-pubescent, especially the leaves beneath, the cauline leaves all sessile, membranous; flower-heads 4—5 lin. long; receptacle glabrous, ... *B. aromatica.*

Almost glabrous, or the thick almost coriaceous leaves beneath shortly hirsute, the lower cauline leaves long-petioled; flower-heads 4—5 lin. long; receptacle densely silky pilose to glabrous, ... *B. sessilifolia.*

O O Scandent shrub. Leaves almost coriaceous, simple.

Almost glabrous; flower-heads 5 lin. long, in small axillary corymbs transforming into terminal pubescent panicles; receptacle villous; pappus white, ...*B. riparia.*

* * *Cauline leaves decurrent and forming entire or interrupted-lacerate leafy wings.*

Flower-heads long peduncled. Florets purple or rose-coloured (Caulopterae, *DC.*)

× Leafy cauline wings cut or variously interrupted.

Leaves pinnatifid-auricled at the base, ... *B. aurita.*
Leaves entire at the base, ... *B. pterodonta.*

× × Leafy cauline wings all entire and continuous.......... *B. alata.*

1. B. AMPLECTENS, DC. in Wight Contr. Ind. Bot. 13 and Prod. V. 433; Clark. Comp. Ind. 71. (*B. arenaria*, DC. Prod. V. 433 ?; *B. tenella*, DC. l. c.; Miq. Fl. Ind. Bat. II. 40; *Conyza amplexicaulis*, Lamk. Dict. II. 85; *Erigeron obliquum*, L. Mant. 572 ?).

HAB. In rubbishy places near Chittagong; Andamans, introduced.—Fl. Fr. March, April.

2. B. BIFOLIATA, DC. Prod. V. 434; Clark. Comp. Ind. 72. (*Conyza bifoliolata*, Willd. sp. pl. III. 1920; Roxb. Fl. Ind. III. 430; *B. anagallidifolia*, DC. Prod. V. 433; *Bl. oligocephala*, DC. Prod. V. 434; *Conyza oligocephala*, Miq. Fl. Ind. Bot. II. 41 ?; *Conyza humifusa*, Miq. Fl. Ind. Bat. II. 41).

HAB. Chittagong, in pastures and along roads; Pegu (Belanger).—Fl. Febr., March; Fr. April.

3. B. OXYODONTA, DC. in Wight Contr. 15 and Prod V. 444; Clark. Comp. Ind. 85. (*Conyza spinidens*, Miq. Fl. Ind. Bat. II. 44 excl. syn. ?)

HAB. Not unfrequent in dry sandy pasture-land, in waste places around and in villages, also river-banks of the Sittang and Irrawaddi delta of Pegu.—Fl. Fr. April—June.

4. B. SPINELLOSA, DC. Prod. V. 433 ?; Clark. Comp. Ind. 84.

HAB. Prome (Wall.).

De Candolle's *B. spinellosa* seems to be a spiny-toothed form of the silvery silk-hairy form of *B. hieracifolia;* Clarke's is near *B. lacera* (with slender peduncles), or near *B. barbata ?*

5. B. WIGHTIANA, DC. in Wight Contr. 14 and Prod. V. 435; Clark. Comp. Ind. 74. (*B. parvifolia*, DC. Prod. V. 437 ?; *B. trichophora*, DC. l. c. 436 *teste* Clark.; *B. hymenophylla*, DC. Prod. V. 440; *B. lacera β. hymenophylla*, Clark. Comp. Ind. 77).

HAB. Common in all mixed forests, especially along choungs, freely springing up in agrarian and waste lands, all over Burma, from Chittagong and Ava down to Tenasserim; also Andamans, here introduced and now spreading.—Fl. Fr. DS.

The colour of the florets and the much smaller size of the flower-heads combined with a viscid pubescence ought to remove all difficulties in distinguishing this species from *B. lacera*, with which Bentham and Thwaites are inclined to combine it. *B. hymenophylla* has pale blue or white florets and is certainly nothing but a slender shade-form which I found in all transitional states in company with *B. Wightiana* (not *B. lacera*, as Clarke states).

6. B. LACERA, DC. Prod. V. 436; Clark. Comp. Ind. 79 quoad var. α. (*Conyza lacera*, Roxb. Fl. Ind. III. 428).

HAB. Arracan, waste places near Akyab; no doubt to be found all over Burma and only overlooked.

7. B. GLANDULOSA, DC. Prod. V. 438; Bth. Fl. Hongk. 177. (*B. lacera*, β. *Heyneana* and γ. *glandulosa*, Clark. Comp. Ind. 78; *B. Heyneana*, DC. Prod. V. 441; *B. cernua*, DC. Prod. V. 436. *teste* Clarke).

HAB. Chittagong.

8. B. DIFFUSA, (*Conyza diffusa*, Roxb. Fl. Ind. III. 429; *B. virens*, DC. in Wight Contr. 14 and Prod. V. 439; Clark. Comp; Ind. 79; *B. lapsanoides*, DC. Prod. V. 440).

HAB. Frequent in the leaf-shedding forests, especially the mixed ones, all over Burma, from Chittagong and Ava down to Tenasserim and the Andamans.—Fl. Fr. C. and HS.

9. B. LACTUCÆFOLIA, DC. Prod. V. 435; Clark. Comp. Ind. 76. (*B. lacera* var. ε. *subcapitata*, Clark. Comp. Ind. 77. excl. syn. DC.).

Var. β. SUBSIMPLEX (*B. subsimplex*, DC. Prod. V. 441; Clark. Comp. Ind. 80; *B. paucifolia*, DC. Prod. V. 440; *A. cuneifolia*, DC. Prod. V. 441, *teste* Clarke), more glabrous and almost simple, the leaves obovate-cuneate and not lobed, but often passing into the runcinate form.

Var. γ. VISCOSULA, Clark. Comp. Ind. 80 sub *B. virente*, excl. syn. DC., densely and shortly glandular-pubescent, the leaves small and rather rigidly runcinate.

Var. δ. NUDIPES, more hirsute instead of pubescent; panicles more squarrose; stem usually naked and destitute of leaves to $\frac{1}{4}$—$\frac{1}{2}$ ft. from the ground.

HAB. Frequent in waste and cultivated lands, along river-banks, on walls, in and around villages, etc., all over Pegu and Martaban, and no doubt generally over Burmah; var. β. with the normal form and only a reduced state of it; var. γ. common in waste lands, on old pagodas and walls, etc. all over Pegu and Martaban down to Upper Tenasserim; var. δ. frequent in the upper mixed forests of the Pegu Yomah, but rare in those and in the eng-forests of Martaban east of Toungboo.—Fl. Fr. C. and HS.

Mr. Clarke refers var. δ. to his *B. fasciculata*, but the long peduncled flower-heads and indeed the whole inflorescence are entirely different.

10. B. LACINIATA, DC. Prod. V. 436. (*Conyza laciniata*, Roxb. Fl. Ind. III. 427; *B. runcinata*, DC. Prod. V. 438; Clark. Comp. Ind. 78; *B. sonchifolia*, DC. Prod. V. 438; *B. cinerascens*, DC. l. c., *teste* Clarke).

HAB. Prome, Meaday (R. Scott).—Fr. April.

11. B. FISTULOSA, (*Conyza fistulosa*, Roxb. Fl. Ind. III. 429; *B. fasciculata*, DC. Prod. V. 442; Clark. Comp. Ind. 81).

Var. α. FASCICULATA, Clark. Comp. Ind. 82 (*B. fasciculata*, DC. l. c.;

B. fistulosa, Roxb. l. c.), spikes more or less panicled; receptacle tawny velvety, the velvet sometimes intermixed with a few white soft hairs.

Var. β. RACEMOSA, Clark. l. c. (*B. racemosa*, DC. Prod. V. 442), spikes almost simple or little branched; receptacles yellowish velvety.

Var. γ. GLOMERATA, Clark. l. c. (*B. glomerata*, DC. Prod. V. 443 *Conyza Burmeana*. Miq. Fl. Ind. Bat. II. 44), spikes more or less panicled; receptacles velvety, the velvet intermixed with copious soft white hairs.

Var. δ. HOLOSERICEA, Clark. l. c. (*B. holosericea*, DC. Prod. V. 442), more simple, thinly silky pilose, the spikes usually simple, rarely with a few additional basal ones, long-silky-pilose; receptacle shortly white pilose.

HAB. Var. α. β. and γ. equally common in all deciduous forests, especially the drier ones, on ruined pagodas and walls, in rubbishy places along river-banks, etc.; and as a troublesome weed in deserted toungyas especially in those of the hills, all over Burma, from Chittagong and Ava down to Tenasserim, up to 4,000 ft. elevation; var. δ. is a laterite form pretty frequent in the eng-and hill-eng forests of Martaban and Tenasserim, but rather rare in the upper dry forests of the Prome Yomah, up to 3,000 ft. elevation.—Fl. Fr. C. and HS.

The above varieties are, with the exception of δ, hardly worth keeping up. Bentham (Fl. Hongk. and Fl. Austr. IV. 526) refers *B. holosericea* DC. to his *B. hieracifolia*, but a scrap of Wallich's authentic specimens shews small sessile heads, indeed represents the upper part of the form correctly referred by Mr. Clarke to the above species. A Hongkong specimen named *B. holosericea* by Dr. Hance—I suppose on Bentham's authority—seems to belong either to the silvery-silky form of *B. lacera* or to *B. hieracifolia* (the flower-heads are too young).

12. B. BARBATA, DC. Prod. V. 434; Clark. Comp. Ind. 73.

Var. α. GENUINA, leaves broader or narrower; flower-heads on slender or short peduncles in a diffuse usually long-pilose panicle, or the panicle reduced and raceme-like but laxly contracted.

Var. β. SERICANS, leaves more elongate-cuneate to almost linear, appressed silvery pubescent like in *B. lacera;* flower-heads larger, almost sessile or thickly peduncled, clustered in the axils of the leaves and gradually passing into terminal dense spikes.

HAB. Var. α. Upper Tenasserim, Moulmein (Falconer); var. β. in the upper mixed forests, rare along the Zamayee choung in the Pegu Yomah, but more frequent in those along the Toukyeghat river in Martaban east of Tounghoo.—Fl. Febr., March; Fr. March, April.

13. B. HIERACIFOLIA, DC. Prod. V. 442; Wight Icon. t. 1099; Clark. Comp. Ind. 82.

Var. α. TYPICA, Clarke l. c. 83 (incl. his var. δ. *Hamiltonii* (*B. Hamiltonii*, DC. Prod. V. 439), little or not branched except from the base;

flower-heads clustered, forming dense terminal spikes. Radical leaves chiefly developed.

Var. *β.* EVOLUTIOR, Clark. l. c. 83, panicles more or less branched, larger or smaller; radical leaves none or marcescent.

HAB. Var. *a.* Tenasserim, Mergui (Wall.), a smaller form; var. *β.* Ava hills.

A species apparently very variable as to inflorescence and habit, the panicled form approaching *B. crinita* and *B. flexuosa* (if these be really distinct from one another), while the subscapiferous forms look somewhat like *Gnaphalium*. *B. lacera*, var. *ε. subcapitata*, Clark. (*B. subcapitata*, DC. Prod. V. 439), is in my eyes the same as Clarke's var. *γ. Nilagirica* of this species.

14. B. MACROPHYLLA, DC. Prod. V. 446; Clark. Comp. Ind. 88. (*Conyza macrophylla*, Bl. Bydr. 896; *B. procera*, DC. Prod. V. 445; Clark. Comp. Ind. 86; *B. semivestita*, DC. Prod. V. 445).

Var. *β.* PROCERA (*B. procera*, DC. Prod. V. 445; Clark. Comp. Ind. 86; *B. semivestita*, DC. l. c.), flower-heads larger; involucral bracts densely pubescent; pappus white.

HAB. Var. *β.* not unfrequent in the pine-forests of the Martaban hills, at 3—5000 ft. elevation, descending into the damp hill-forests and becoming more robust and large-leaved (*B. macrophylla*); also Ava, Khakyen hills (J. Anderson).—Fl. March, April; Fr. April.

15. B. BALSAMIFERA, DC. Prod. V. 447; Clark. Comp. Ind. 89, (*Conyza balsamifera*, L. sp. pl. 1208; Roxb. Fl. Ind. III. 427; *B. densiflora*, DC. Prod. V. 446; Clark. Comp. Ind. 88; *B. excisa*, DC. Prod. V. 446; *B. grandis*, DC. Prod. V. 447 ?; *Inula oblonga* var. *a.* DC. Prod. V. 4 quoad specim. e Taong-dong).

HAB. Common and freely springing up in and often exclusively covering deserted toungyas, but also in savannahs, along river-banks, etc., all over Burma, from Chittagong and Ava down to Tenasserim, up to 3,000 ft. elevation.—Fl. Fr. HS.

16. B. AROMATICA, DC. Prod. V. 446; Clark. Comp. Ind. 88.

HAB. Tenasserim.

Looks like a grandular-pubescent from of *B. sessilifolia*, DC.

17. B. SESSILIFOLIA, DC. Prod. V. 447. (*Conyza sessilifolia*, Bl. Bydr. 897; *B. myriocephala*, DC. Prod. V. 445; *B. squarrosa*, Clark. Comp. Ind. 87).

Var. *a.* GENUINA, receptacle more or less densely pilose; leaves beneath and involucral bracts often more hairy.

Var. *β.* LANCEOLARIA (*Conyza lanceolaria*, Roxb. Fl. Ind. VII. 432; *B. longifolia*, DC. Prod. V. 446; *B. Wallichii*, Clark. Comp. Ind. 87, excl. syn. plur.; *Conyza nitida*, Miq. Fl. Ind. Bat. II. 55. *teste* Clarke), receptacle glabrous, or in forms sparingly pilose.

HAB. Both varieties frequent along choungs in the tropical forests, and also often seen in the hill-toungyas, of Martaban and the Andamans; Upper Tenasserim; Ava, Khakyen hills.—Fl. Febr., March.

Nicobar specimens, and indeed Blume's *Conyza sessilifolia* itself, have the receptacle glabrous or sparingly silky pilose, and thus invalidate this artificial character.

18. B. RIPARIA, DC. Prod. V. 444; Clark. Comp. Ind. 85. (*Conyza riparia*, Bl. Bydr. 899, non Kth).

HAB. Forests of South Andaman.—Fl. March.

19. B. ALATA, DC. Prod. V. 448; Wight Icon. t. 1101; Bth. Fl. Hongk. 177. (*Conyza alata*, Roxb. Fl. Ind. III. 430; *B. vernonioides*, DC. Prod. V. 447; *Conyza nutans*, Bl. Bydr. 896; Miq. Fl. Ind. Bat. II. 57; *Laggera alata*, Bth.; Clark. Comp. Ind. 91).

HAB. In the drier hill-forests, and in hill toungyas, of the Martaban hills east of Tounghoo; Karenee hills (Revd. Mason).

20. B. PTERODONTA, DC. in Wight Contr. 15 and Prod. V. 448; Wight Icon. t. 1100. (*Laggera pterodonta*, Bth.; Clark. Comp. Ind. 92).

HAB. Frequent in toungyas and poonzohs, chiefly of the hilly parts, of Pegu, Martaban, and Upper Tenasserim; also not unfrequently seen in the drier hill-forests, and ascending up to 6000 ft. elevation; Ava, Khakyen-hills; Chittagong.—Fl. Fr. March, April.

21. B. AURITA, DC. Prod. V. 449. (*Conyza aurita*, Roxb. Fl. Ind. III. 428; *Laggera aurita*, Bth.; Clark. Comp. Ind. 92).

HAB. Here and there springing up in toungyas of Pegu and Martaban; more frequent along the Irrawadi in Prome; Ava (Griff. 3164).—Fl. Fr. March, April.

Doubtful Species.

1. *B. napifolia*, DC. Prod. V. 440.—Tavoy (Wall.).
2. *B. membranacea*, DC. Prod. V. 440.—Prome (Wall.).
3. *B. viscosula*, DC. Prod. V. 441, non Clark.—Taong-dong (Wall.).

Pluchea, Cass.

Conspectus of Species.

* *Annuals, glabrous. Florets intensely yellow. Corymbs irregular, small.*

Erect, simple or branched, the cauline leaves sessile with broad rounded base; flower-heads about 2½ lin. long, on rather short smooth peduncles, ... *P. Doniana.*

* * *Shrubs or undershrubs. Florets purple to lilac. Corymbs dense, terminal. (Receptacle glabrous).*

Leaves obovate, blunt or acute; flower-heads 22½ lin. long, the bracts shortly pubescent, bluntish to acute; shrub, ... *P. Indica.*

Leaves linear, glandular-pubescent, acuminate; flower-heads as in preceding, but the inner bracts more acuminate, ... *P. eupatorioides.*

1. P. DONIANA, (*Erigeron falcatum*, Don. Prod. Fl. Nep. 172; *B. flava*, DC. Prod. V. 439; *B. senecioides*, DC. Prod. V. 439; *Laggera flava*, Bth.; Clark. Comp. Ind. 90; *Conyza repanda*, Roxb. Fl. Ind. III. 431, *teste* Clarke).

HAB. Common in all leaf-shedding forests, more especially in the eng-forests, where it is often reduced to a mere pygmy; all over Burma, from Chittagong and Ava down to Tenasserim.—Fl. Fr. C. and HS.

I place this species only reluctantly in *Pluchea*. But I cannot find any ally to it in *Blumea*, while here it has a very near one in *P. linearifolia*.

2. P. INDICA, Less. in Linn. 1831. 150; DC. Prod. V. 451; Wight Illustr. t. 131 (flowers wrongly coloured yellow); Clark. Comp. Ind. 93 (*Baccharis Indica*, L. sp. pl. 1205; *Conyza corymbosa*, Roxb. Fl. Ind. III. 426; *P. foliolosa*, DC. Prod. V. 451? ; Clark. Comp. Ind. 95 ?).

HAB. Frequent in the beach- and tidal forests, entering also the tidal savannahs; all along the coasts, from Chittagong down to Tenasserim and the Andamans.—Fl. CS.; Fr. HS.

3. P. EUPATORIOIDES, Kurz For. Fl. II. 575.

HAB. Adjoining Siamese province of Radbooree (Teysmann).—Fl. Fr. April, May.

N. B. *Laggera arida*, Clark. Comp. Ind. 92 = *Pluchea frutescens*, Bth. in Hook. Icon. pl. t. 1157.

Microglossa, DC.

1. M. VOLUBILIS, DC. Prod. V. 320; Clark. Comp. Ind. 57. (*Sonchus volubilis*, Rumph. Herb. Amb. V. t. 104. f. 1.; *Conyza pyrifolia*, Lamk. Dict. II. 89; *Conyza prolifera*, Bl. Bydr. 897; *Erigeron pyrifolius*, Bth. Fl. Hongk. 176).

HAB. Frequent in grass-jungles and old deserted toungyas all over Martaban and Tenasserim, up to 3500 ft. elevation; Ava, Khakyen hills. —Fl. Febr.; Fr. March.

Conyza, Less.

Conspectus of Species.

* *Flower-heads very small, not above a line long, very numerous, corymbose.*

Erect branched annual, shortly pubescent, the leaves small, simple or 3-cleft; pappus more or less rufescent, ... *C. pinnatifida*.

* * *Flower-heads* 2—4 *lin. long.*

× Pubescence not viscid nor glandular; leaves serrate to almost lobed, cuneate at base.

Erect, more or less branched annual, more or less hirsute; flower-heads spherical, corymbose; pappus white, ... *C. semipinnatifida*.

Erect, simple or more usually branched from the base, hirsute or pubescent; flower-heads not spherical, in dense terminal corymbs or clusters; pappus rufescent, ..*C. veronicæfolia.*

× × Glandular, otherwise almost glabrous; leaves almost entire, narrow. Erect, branched; flower-heads 2—2½ lin. long, on glandular puberulous peduncles, corymbose; pappus pinkish to pinkish white, ...*B. viscidula.*

1. C. PINNATIFIDA, Roxb. Fl. Ind. III. 430. (*C. absinthifolia*, DC. Prod. V. 383; Clark. Comp. Ind. 64).

HAB. Frequent in the drier hill-forests and more so in deserted and cultivated toungyas and open waste places, etc., of the Martaban hills, at 2—5000 ft. elevation; Ava, Khakyen hills.—Fl. Fr. Febr.—April.

2. C. SEMIPINNATIFIDA, Wall. Cat. 3058; DC. Prod. V. 382; Clark. Comp. Ind. 62.

HAB. Frequent along the banks of the larger rivers, such as the Irrawaddi and Sittang, from Prome and Martaban southwards.—Fl. Fr. HS.

3. C. VERONICÆFOLIA, Wall. Cat. 3005; DC. Prod. V. 382; Bth. Fl. Hongk. 176; Clark. Comp. Ind. 62. (*C. Japonica*, Less. Syn. 204; DC. Prod. V. 382).

HAB. Martaban, Nattoung, in the pine-forests, at about 7000 ft. elevation.—Fl. March.

4. C. VISCIDULA, Wall. Cat. 3006; DC. Prod. V. 383; Bth. Fl. Austr. IV. 496; Clark. Comp. Ind. 63. (*C. striata*, Wall. Cat. 3065; DC. Prod. V. 383; *C. Wallichii*, DC. l. c. 384 ex part.; *C. polycephala*, Edg. in Linn. Trans. XX. 66; Walp. Rep. VI. 720).

HAB. Common in toungyas and in open grassy spots, as well in the drier hill-forests of Martaban, up to 6000 ft. elevation, as in the Pegu and Prome Yomah, here descending as low as to 3—400 ft. elevation; also Tenasserim.—Fl. Fr. Jan.—March.

Thespis, DC.

1. TH. DIVARICATA, DC. Prod. V. 375; Clark. Comp. Ind. 65. (*Th. erecta*, DC. Prod. V. 375).

HAB. Rather frequent along the banks of the larger rivers, as along the Sittang and Irrawaddi in Pegu; Chittagong, on the banks of the Megna.—Fl. May, June; Fr. RS.

Cyathocline, Cass.

1. C. LYRATA, Cass. in Ann. d. sc. nat. 1829. 34; DC. Prod. V. 374; Wight Icon. t. 1098; Clark. Comp. Ind. 37 (*Artemisia hirsuta*, Rottl. in Spreng. Syst. III. 490; *C. stricta*, DC. Prod. V. 374).

HAB. Common on rock-walls and mossy boulders, etc. in the choungs and torrents all over Burma, from Chittagong and Ava down to Pegu and Arracan.—Fl. Fr. CS.

Grangea, Ad.

1. G. Maderaspatana, Poir. Dict. Suppl. III. 825; DC. Prod. V. 373; Wight Icon. t. 1097; Clark. Comp. Ind. 37. (*Artemisia Maderaspatana*, Roxb. Fl. Ind. III. 412).

Hab. A common weed in fallow agrarian lands, along the banks of rivers, waste places in and around villages, etc., all over Burma, down to Tenasserim.—Fl. C. and HS.; Fr. HS.

Myriactis, Less.

1. M. Wallichii, Less. in Linn. 1831. 127; DC. Prod. V. 309; Clark. Comp. Ind. 38.

Hab. Martaban, in open grassy places and along the outskirts of the hill-forests on Nattoung, at about 6—7000 ft. elevation.—Fr. CS.

Rhynchospermum, Rwdt.

1. R. verticillatum, Rwdt. in Bl. Bydr. 902; DC. Prod. V. 296; Miq. Fl. Ind. Bat. II. 32; Clark. Comp. Ind. 39. (*Leptocoma racemosa*, Less. and NE. in Linn. 1831. 130; DC. Prod. V. 280; *Zollingeria scandens*, Schultz. Bip. in Reg. Flor. 1854. 274; Walp. Ann. V. 250.)

Hab. Ava, hills east of Bhamo (J. Anderson).—Fr. September.

Boltonia, L'Her.

1. B. Indica, Bth. Fl. Hongk. 174; Clark. Comp. Ind. 40. (*Aster Indicus*, L. sp. pl. 1230; Burm. Fl. Ind. 181; *Asteromoea Indica*, Bl. Bydr. 901; DC. Prod. V. 303; *Calimeris integrifolia*, DC. Prod. V. 259, *teste* Clarke; *Callistemma Indicum*, G. Don in Lond. Hort. Brit. t. 348; *Hisutsua Cantoniensis*, DC. Prod. VI. 44; *Hisutsua serrata*, Hook. and Arn. Bot. Beech. 265; *Chrysanthemum cuneatum*, Roxb. Fl. Ind. III. 436).

Hab. Ava, Khakyen hills (J. Anderson).—Fl. May—September.

Callistephus, Cass.

*1. C. Chinensis, NE. Aster. 221; DC. Prod. V. 274; Clark. Comp. Ind. 41. (*Aster Chinensis*, L. sp. pl. 1232; Roxb. Fl. Ind. III. 433).

Hab. Cultivated in gardens of Burma (*teste* Clarke).

Erigeron, L.

1. E. Ægyptiacum, L. Mant. 112; Jacq. Hort. Vindob. III. 19. (*Conyza Ægyptiaca*, Ait. Hort. Kew. III. 183; DC. Prod. V. 382; Bth. Fl. Austr. IV. 497; *E. asteroides*, Roxb. Fl. Ind. III. 432; *E. hispidum*, DC. Prod. V. 292; Clark. Comp. Ind. 54; *Conyza asteroides*, Wall. Cat. 3052, non L.; DC. Prod. V. 382; *Blumea pubiflora*, DC. Prod. V. 434; *E. sublyratum*, Roxb. ap. DC. Prod. V. 292; *Conyza Jerdoni*, Clark. Comp. Ind. 62, fol. subpinnatifidis et radio apparenter deficiente).

Hab. Pegu and Martaban, not unfrequent along the banks of the Sittang; most probably also elsewhere.—Fl. Fr. May.

The ligulate ray-florets seem to be sometimes absent, at least in dried specimens they appear so. The Egyptian plant agrees in all parts with the Indian, but appears to be often ray-less.

N. B. *Conyza angustifolia*, Roxb. Fl. Ind. III. 429. (DC. Prod. V. 83), appears from the description and MS. figure to be a luxuriant form of *E. Canadensis*, L., or *E. linifolius*, Willd., and is, therefore, hardly an Andamanese plant.

Gynura, Cass.

Conspectus of Species.

Pubescent; leaves rather small, ovate to linear-lanceolate, repand-toothed, acuminate; peduncles and involucral bracts hoary pubescent, ... *G. Nepalensis.*

Pubescent, the root tuberous; leaves more or less laciniate to pinnatifid; peduncles and involucre-bracts less hairy, ... *G. sinuata.*

1. G. Nepalensis, DC. Prod. VI. 3000; Clark. Comp. Ind. 171. (*G. foetens*, DC. l. c.).

Hab. Ava, Irrawaddi, on the Pingee rocks (Wallich).—Fl. Oct.

2. G. sinuata, DC. Prod. VI. 301; Clark. Comp. Ind. 173.

Hab. Frequent in the eng- and low forests of the Sittang valley in Pegu, and in those of Martaban.—Fl. April, May; Fr. June.

As long as it is young, the plant looks almost scapiferous and the leaves are then simpler and smaller, but at the rate that the tuberous roots enlarge the plant becomes more robust, larger, and branched from the base with the leaves up to 7 in. long.

Notonia, DC.

1. N. crassissima, DC. Prod. VI. 442. (*Composita*, Griff. Not. Dicot. 252. t. 470).

Hab. Ava, on the limestone-hills near Segain (Wall., Griff.)—Fl. May.

Emilia, Cass.

Conspectus of Species.

Achenes papillose-rough; style-branches erect, half-cylindrical with a short conical appendage; lower leaves more or less lyrate, ... *E. sonchifolia.*

Achenes quite glabrous; style-branches elongate, recurved, almost club-shaped at the apex; lower leaves elongate-spatulate, ... *E. prenanthoidea.*

1. E. sonchifolia, DC. Prod. VI. 302; Clark. Comp. Ind. 174. (*Cacalia sonchifolia*, L. sp. pl. 1169, non Forsk.; Roxb. Fl. Ind. III. 413; *Gynura ecalyculata*, DC. Prod. VI. 298; *E. sagittata*, DC. Prod. VI. 302; *E. flaccida*, Miq. Fl. Ind. Bat. II. 102; *Senecio sonchifolius*, Bth. Fl. Hongk. 189).

Hab. Common in agrarian and garden land, in deserted toungyas, in waste and rubbishy places, along river-banks, etc., also in the savannahs, all over Burma, from Chittagong and Ava down to Tenasserim.—Fl. C. and HS.; Fr. HS.

2. E. PRENANTHOIDEA, DC. Prod. V. 303; Clark. Comp. Ind. 176 (*E. angustifolia*, DC. l. c.).

Hab. Ava, hills east of Bhamo (J. Anderson).—Fl. Fr. Aug.

Senecio, L.

Conspectus of Species.

Subg. 1. *Eu-Senecio.* Anthers not tailed at the base. Achenes all with, or those of the ray, without pappus.

* *Achenes all with pappus.*

Almost glabrous, the flower-stems almost scapiform; lower leaves elongate-cuneate-oblong; flower-heads short peduncled, in dense corymbs; achenes of the disk papillose-rough; pappus white, ... *S. obtusatus.*

Almost glabrous or more or less hirsute; leaves narrow-linear, with involute margins; flower-heads long-peduncled, few; achenes papillose-rough; pappus more or less pubescent, ... *S. Griffithii.*

* * *Achenes of the ray without pappus.*

Roughish hirsute; leaves elongate-linear, narrowed at the base; flower-heads in lax corymbs; achenes striate, glabrous; pappus rufescent, ... *S. saxatilis.*

Subg. 2. *Synotis.* Anthers tailed, the tails free or adnate.

* *Erect shrubs or undershrubs.*

Stem and leaves beneath white-tomentose; flower-heads radiate, rather large, in dense corymbose panicles; achenes glabrous; pappus white, ... *S. densiflorus.*

Glabrous or nearly so; flower-heads small, glabrous, discoid, in small dense corymbs; achenes glabrous; pappus white, ... *S. triligulatus.*

* * *Scandent shrubs or undershrubs.*

Stems almost zigzag-flexuose, slightly woolly and glabrescent; flower-heads discoid, rather large, in divaricate corymbose panicles; achenes difform, those of the disk 5-gonous with pilose corners and white pappus, the ray-achenes glabrous, almost trigonous. .... *S. Chinensis.*

1. S. OBTUSATUS, Wall. Cat. 3133; DC. Prod. VI. 367; Clark. Comp. Ind. 192.

Hab. Ava, Khakyen hills east of Bhamo. (J. Anderson). Fl. May.

2. S. GRIFFITHII, Hf. and Th. MS.; Clark. Comp. Ind. 193.

Var. α. GENUINA, leaves longer and glabrous or nearly so; flower-heads longer peduncled, the involucral bracts nearly glabrous.

Var. β. KURZII, Clark. Comp. Ind. 194. a fruticulose undershrub, the leaves hirsute on both sides or almost chaffy pilose along the midrib beneath; flower-heads shorter peduncled, the involucral-bracts more pubescent.

Hab. Var. β. rather frequent on rocks and in open grassy places in the pine-forests of the highest ridges of the Martaban hills, at 6000—7100 ft. elevation.—Fl. Jan., Febr.; Fr. March.

3. S. SAXATILIS, Wall. Cat. 3131; DC. Prod. VI. 367.

HAB. Ava, Taong-dong (Wall.).

Judging from the description only it seems allied to *S. linifolius*, *S. pilosulus*, etc.

4. S. DENSIFLORUS, Wall. Cat. 3116; DC. Prod. VI. 369; Clark. Comp. Ind. 185. (*S. angulosus*, DC. l. c.; *S. uncinellus*, DC. l. c. 368).

HAB. Frequent in grassy and open places in the drier hill-forests, especially the pine-forests, of Martaban, at 3000—6000 ft. elevation.—Fl. Febr., March; Fr. March, April.

5. S. TRILIGULATUS, Ham. in Don. Prod. Fl. Nep. 178; DC. Prod. VI. 368. (*S. vagans*, Wall. Cat. 3108; DC. Prod. VI. 368; Clark. Comp. Ind. 188).

HAB. Ava, Khakyen hills east of Bhamo (J. Anderson).—Fr. March.

6. S. CHINENSIS, DC. Prod. VI. 363; Bth. Fl. Hongk. 190. (*Cineraria Chinensis*, Spreng. Syst. III. 549; *Cineraria repanda*, Lour. Fl. Coch. II. 613, non Willd.; *S. campylodes*, DC. Prod. VI. 376; Clark. Comp. Ind. 183; *S. Hindsii*, Bth. in Lond. Journ. Bat. I 488).

HAB. Ava, Khakyen hills, east of Bhamo (J. Anderson).—Fl. March.

Doubtful species.

7. S.? PEGUANUS, DC. Prod. VI. 365.

HAB. Pegu (Belanger).

This, according to Aug. Pyr. DeCandolle, has the habit, leaves, and achenes of *Cineraria*.

Eupatorium, Tournef.

Conspectus of Species.

× Leaves penninerved.

Corymbs of few small few-flowered flower-heads, ... *E. Birmanicum.*

Flower-heads numerous, in corymbose, elongate panicles, ... *E. Punduanum.*

× × Leaves triplinerved.

Flower-heads numerous, in corymbs, ... *E. Wallichii.*

1. E. BIRMANICUM, DC. Prod. V. 179, *vix* Clarke.

HAB. Ava, Segain (Wall. 3290).

2. E. PUNDUANUM, Wall. Cat. 3170; DC. Prod. V. 179; Clark. Comp. Ind. 33. (*E. nodiflorum*, Wall. Cat. 3166; DC. Prod. V. 179; Clark. Comp. Ind. 33).

HAB. Burma (*teste* Clarke, non DC.)

Bentham (Fl. Hongk. 172) refers this species to the following, and the penninervation really seems to be a fallacious character.

3. E. WALLICHII, DC. Prod. V. 179. (*E. cannabinum*, Clark. Comp. Ind. 34, non L.).

HAB. Upper Burma (*teste* Clarke).

Mikania, Willd.

1. M. SCANDENS, Willd. sp. pl. III. 1743; DC. Prod. V. 199; Clark. Comp. Ind. 34. (*Eupatorium scandens*, Burm. Fl. Ind. (1746) 176. excl. syn.; *Eupatorium cordatum*, Burm. Fl. Ind. 176 t. 58. f. 2; *Eupatorium volubile*, Vahl. Symb. (1794) III. 93; *M. volubilis*, Willd. sp. pl. III. 1743, DC. Prod. V. 199).

HAB. Upper Tenasserim, Attaran (Wall. Cat. 3174).—Fl. May.

Ageratum, L.

1. A. CONYZOIDES, L. sp. pl. 1175; Hook. Exot. Fl. t. 15; DC. Prod. V. 108; Schlechtdl. in Linnæa XXXIX. 493, Clark. Comp. Ind. 30. (*Ageratum cordifolium*, Roxb. Fl. Ind. III. 415).

HAB. A common weed in all cultivated and waste lands, along riversides, deserted toungyas, etc., springing up in the forests wherever light permits, all over Burma and adjacent islands; Andamans, introduced and rapidly spreading. Fl. R. S.

Adenostemma, Forst.

1. A. VISCOSUM, Forst. Nov. gen. no. 15; DC. Prod. V. 111; Bth. Fl. Hongk. 171; Clark. Comp. Ind. 28. (*Ageratum aquaticum*, Roxb. Fl. Ind. III. 416; *A. fastigiatum*, DC. Prod. V. 111; *A. Roylei*, DC. Prod. V. 112; *A. elatum*, Don Prod. Fl. Nep. 181; DC. Prod. V. 112; Wight Icon. t. 1087; *A. rugosum*, DC. Prod. V. 112; *A. Madurense*, DC. Prod. V. 112; *A. rivale*, Dalz. in Hook. Kew. Gard. Misc. III. 231).

Var. α. VERUM, Clark. Comp. Ind. 29 (incl. varr. *elatum* and *latifolium*, Clark. l. c.), larger, the leaves larger and broader, often somewhat succulent; flower-heads larger; achenes more or less glandular muricate.

Var. β. MICROCEPHALUM, Clark. l. c. 29 (*A. microcephalum*, DC. Prod. V. 111), as preceding, but usually thinner and the leaves smaller; heads very small.

Var. γ. ANGUSTIFOLIUM, Clark. l. c. 29 (*A. angustifolium*, Edg. in Journ. As. Soc. Beng. XXI. 173; Walp. Ann. V. 153), leaves elongate-linear, rest as in var. α.

Var. δ. RETICULATUM, Clark. l. c. 30 (*A. reticulatum*, DC. Prod. V. 112; Wight Icon. t. 1088; *A. leiocarpum*, DC. Prod. V. 112; *A. erectum*, DC. Prod. V. 113), as var. α., but leaves somewhat rough above and often more or less lacunose, tawny pubescent on the nerves beneath; achenes smooth.

HAB. var. α. frequent in the mixed forests of the Pegu and Arracan Yomah; Ava hills; var. β. along with the typical form but scarcer; var. (?) γ. Tenasserim (Helf. 3109).—Fl. Fr. C. and HS.

Elephantopus, L.

1. E. SCABER, L. sp. pl. 1313; DC. Prod. V. 86; Roxb. Fl. Ind. III. 445; Wight Icon. t. 1086; Bth. Fl. Hongk. 171; Clark. Comp. Ind. 28. (*E.* sp Griff. Not. Dicot. 222).

HAB. Common in dry grass-land, rubbishy places, along the borders of fields and rivers, of the cultivated plains and also in the mixed forests (especially the upper ones), all over Burma, from Chittagong and Ava down to Tenasserim.—Fl. Sept.—March.

Ethulia, L.

1. E. CONYZOIDES, L. sp. pl. 1171; Linn. f. Dec. I. t. 1; Bot. Reg. t. 695; DC. Prod. V. 12; Clark. Comp. Ind. 1. (*E. ramosa*, Roxb. Fl. Ind. III. 413).

HAB. Chittagong, banks of the Megna near Comillah (Clarke).—Fl. April, May; Fr. RS.

Vernonia, Srhreb.

Conspectus of Species.

Subg. 1. *Cyanopis.* Flower-heads small. Achenes 4—5-cornered or terete, not ribbed. Outer row of pappus bristly or paleaceous. Low annual herbs.

* *Achenes 4-cornered.* (Cyanopis, Bl.)

Greyish puberulous or thinly pubescent; flower-heads broad, in poor corymbs; involucral bracts stiff, squarrose, acuminate, ... *V. Chinensis.*

* * *Achenes terete* (Tephrodes).

Greyish puberulous; flower-heads 2½—3 lin. long, corymbose-panicled, ... *V. cinerea.*

Subg. 2. *Eu-Vernonia.* Flower-heads rather large or rarely small. Achenes longitudinally ribbed. Involucre-bracts all scarious, not leafy nor leafy-appendaged.

* *Undershrubs or herbs. Involucre-bracts elongate, especially the inner ones, and usually narrow.*

× Outer involucral bracts subulate and squarrose, passing on to the peduncle. Outer pappus consisting of numerous almost chaff-like bristles.

Slightly puberulous; leaves narrow or broad, shortly petioled or almost sessile; flower-heads rather large, on long stiff peduncles, corymbose-panicled; achenes densely villous, ... *V. bracteolata.*

× × Outer involucral bracts rather broad and short, more or less appressed-imbricate.

+ Outer series of pappus consisting of a few caducous bristles or almost wanting.

† Flower-heads large, many-flowered, solitary or few, or in poor corymbs. Involucral-bracts very acuminate. Harsh-leaved undershrubs or herbs. (*Xipholepis.*)

Flower-heads long-peduncled, in lax corymbs; achenes 2 lin. long, glabrous; bristles of pappus bristly, ... *V. bracteata.*

Flower-heads short-peduncled, in compact corymbs; achenes 1 lin. long, sparingly pilose; bristles of pappus smooth, ... *V. Roxburghii.*

Flower-heads sessile or nearly so, clustered or solitary; achenes 1 lin. long, appressed pilose; bristles of pappus smooth, ... *V. squarrosa.*

† † Flower-heads small or rather small, few- (not above 15-) flowered, in ample corymb-like panicles. Involucral bracts bluntish or hardly acuminate. (*Gymnanthemum.*)

Roughish puberulous; leaves narrow, rarely broad; flower-heads only 3 lin. long, numerous, in axillary and terminal corymbs, ... *V. aspera.*

Roughish puberulous; leaves rather broad or narrow; flower-heads 4—5 lin. long, shortly peduncled, in axillary and terminal panicled corymbs, ... *V. saligna.*

+ + Outer series of pappus consisting of numerous or copious bristles. Involucral bracts acuminate. (*Lepidaploa.*)

Leaves broad, roughish puberulous; flower-heads peduncled, in small sessile pubescent axillary corymbs, or corymbose-panicled at the end of the branches; involucral bracts white woolly, ... *V. Kingii.*

Leaves narrow, roughish puberulous, chartaceous; flower-heads shortly peduncled or sessile, solitary or few in the leaf-axils, irregularly disposed raceme-like or forming terminal poor corymbs; involucral bracts nearly glabrous, ... *V. attenuata.*

* * *Large shrubs or trees, rarely scandent. Flower-heads usually small and few-flowered.*

× Pappus more or less tawny to red-brown. Involucre-bracts elongate especially the inner ones. Scandent shrubs.

Glabrous or nearly so; flower-heads ½ in. long, shortly peduncled, in small corymbs panicled at the end of the branches; leaves petioled; achenes pilose, .. *V. blanda.*

As preceding, but shortly puberulous; achenes glabrous, ... *V. scandens.*

× × Pappus white or whitish to pale straw-coloured. Involucre-bracts short and rather broad. Flower-heads small. (*Strobocalyx.*)

+ Trees or erect shrubs.

× Leaves sessile or very shortly petioled.

Small tree, pubescent or puberulous; leaves cuneate-narrowed, shortly petioled; flower-heads shortly peduncled, corymbulose, in terminal leafless panicles; involucre-bracts slightly and fugaceously appressed pubescent, ... *V. volkameriaefolia.*

× × Leaves rather long-petioled.

Meagre shrub or small tree, softly tomentose; leaves broad; flower-heads shortly peduncled, corymbose-panicled; involucral bracts densely white-tomentose, .. *V. Kurzii.*

Tree; leaves coriaceous, long-petioled, densely tomentose beneath, glabrescent above or rarely also beneath; flower-heads sessile or nearly so, clustered, in corymb-like tomentose panicles; involucre-bracts thinly appressed pilose, ... *V. arborea.*

+ + Scandent shrubs.

Stem and leaves beneath appressed silvery pubescent; flower-heads almost sessile, divaricate corymbose and panicled; involucre-bracts glabrous, ciliate, .. *V. elaeagnifolia.*

Subg. 3. *Hololepis.* Outer involucre entirely leafy and large, or smaller and produced into a leafy appendage.

* *Outer involucre-bracts large and leafy, entirely concealing the inner ones* (Hololepis, DC.).

Leaves broadly oval, almost sessile, rather glabrous; flower-heads peduncled, corymbose, ... *V. calycina.*

* * *Outer involucre-bracts scarious, produced at the tips into a foliaceous linear appendage.* (Stengelia.)

Shortly and thinly pubescent; leaves petioled; flower-heads corymbose; pappus rufescent, ... *V. anthelminthica.*

1. V. CINEREA, Less. in Linn. 1829, 291 and 1831. 673; DC. Prod. V. 24; Bth. Fl. Austr. IX. 459; Clark. Comp. Ind. 20. (*Conyza cinerea*, L. sp. pl. 1208; *Serratula cinerea*, Roxb. Fl. Ind. III. 406; *V. abbreviata*, DC. Prod. V. 25; *V. physalifolia*, DC. l. c. 24; *V. laxiflora*, Less. in Linn. 1831. 646; DC. Prod. V. 25; *Chrysocoma purpurea*, G. Forst. Prod. 54).

HAB. Common, not only in all leaf-shedding forests but still more so in all cultivated and waste lands, along river-banks, on old pagodas, etc., all over Burma, down to Tenasserim, up to 4000 ft. elevation; Andamans, introduced and now common.—Fl. Fr. C. S.

2. V. CHINENSIS, Less. in Linn. 1831. 674; Miq. Fl. Ind. Bat. II. 18; Bth. Fl. Hongk. 169; Clark. Comp. Ind. 18. (*Conyza Chinensis*, Lamk. Dict. II. 83, non L.; *Cyanopis pubescens*, Bl. Bydr. 890; DC. Prod. V. 69; *Cyanopis villosa*, DC. Prod. V. 69).

HAB. Frequent, especially in rubbishy and waste places in and around villages, along river-banks, etc., of the cultivated plains, less so in open places of the mixed forests, all over Pegu, Arracan, Martaban, and Tenasserim—Fl. Aug.—Jan.; Fr. CS.

3. V. BRACTEOLATA, DC. Prod. V. 62. (*V. subsessilis*, DC. Prod. V. 62; Clark. Comp. Ind. 10).

Var. *α*. BRACTEOLATA, Clark. Comp. Ind. 10, leaves obovate to obovate-oblong, acute; pappus often darker rufescent.

Var. *β*. SUBSESSILIS, Clark. l. c., lower, the leaves linear to linear-oblanceolate, acuminate; pappus usually paler coloured.

HAB. Ava, Khakyen hills, east of Bhamo (J. Anderson).—Fl. Fr. CS.

4. V. BRACTEATA, Wall. Cat. 2921; Clark. Comp. Ind. 17. (*Decaneuron Silhetense*, DC. Prod. V. 67; Wight Icon. t. 1083).

HAB. Karenee hills (Revd. F. Mason).

5. V. ROXBURGHII, Less. in Linn. 1831. 674. (*Eupatorium asperum*, Roxb. Fl. Ind. III. 415; *V. aspera*, DC. Prod. V. 31, non Ham.; Clark. Comp. Ind. 17).

HAB. Ava, apparently frequent about Bhamo and the hills east of it.—Fl. CS.; Fr. C. and HS.

6. V. SQUARROSA, Less. in Linnæa 1831. 627, note of p. 678. (*V. teres*, Wall. Cat. 2926; DC. Prod. V. 15; Clark. Comp. Ind. 16; *Acilepis squarresa*, Don Prod. Nep. 169; *V. rigiophylla*, DC. Prod. V. 15).

HAB. Frequent in the eng and dry forests of Pegu, Prome, and Ava.—Fl. CS.; Fr. HS.

Lessing called two different plants by the above name, but according to the laws of priority Don's name has precedence, and the Brazilian plant must be called either *V. rubricaulis*, Less. or *V. plantaginoides*, Less., two names for the same plant published two years previously to Lessing's Brazilian *V. squarrosa.*

7. V. ASPERA, Ham. in Trans. Linn. Soc. XIV (1825) 219, vix Less., nec DC. Clark. etc. (*V. multiflora*, Less. in Linn. 1831. 642 ; DC. Prod. V. 31 ; *Decaneuron divergens*, DC. in Wight Contr. 8 and Prod. V. 68 ; Wight Icon. t. 1084 ; *V. divergens*, Clark. Comp. Ind. 64 ; *Eupatorium divergens*, Roxb. Fl. Ind. III. 415 and Icon. MS. XIII. t. 23).

Var. β. NILGHERRYENSIS, (*V. Nilgherryensis*, DC. Prod. V. 32 ; Wight Icon. t. 1078 ; *V. aspera*, Less. in Linn. 1831. 643 ?), more pubescent, the pappus white or nearly so.

HAB. Var. α. frequent in all leaf-shedding forests, along river-sides, etc. all over Burma, from Chittagong and Ava down to Tenasserim ; freely springing up in deserted toungyas and also in the savannahs.—Fl. CS. ; Fr. HS.

8. V. SALIGNA, DC. Prod. V. 33 ; Clark. Comp. Ind. 13. (*V. longicaulis*, DC. Prod. V. 33).

Var. α. GENUINA, corymbs more or less panicled ; involucre-bracts more acute to mucronate-acuminate, more glabrous.

Var. β. PEGUENSIS (*V. Peguensis*, Clark. Comp. Ind. 13), a shade-form, panicles spreading, terminal, leafless ; involucre-bracts more or less acute, usually more glabrous.

HAB. Var. *α.* Ava, Khakyen hills (J. Anderson) ; Chittagong, Seetakhund hill ; var. β. in the upper-mixed forests of the southern parts of the Pegu Yomah.—Fl. CS. ; Fr. C. and HS.

9. V. KINGII, Clark. Comp. Ind. 12.

HAB. Here and there in the tropical and moister upper-mixed forests of the southern slopes of the Pegu Yomah, and in those of Martaban east of Tounghoo ; also Ava, Khakyen hills (J. Anderson).—Fl. Fr. CS.

10. V. ATTENUATA, DC. Prod. V. 33 ; Clark. Comp. Ind. 12.

Var. α. GENUINA, flower-heads about half an inch across, longer or shorter peduncled and usually in the axils of the leaves.

Var. β. JUNCEA, judging from the material at hand, the whole plant seems to be transformed into an ample leafless panicle, the flower-heads only half the size, all sessile and solitary, in very elongate slender poor spikes ; achenes only a line long or somewhat longer, the pappus pale rufous.

HAB. Var. α. Upper Tenasserim, Moulmein (Falconer) ; var. β. adjoining Siamese province of Radburi (Teysmann).—Fl. Fr. CS. ; Fr. C. and HS.

Var. β. may form a distinct species, but there are no leaves.

11. V. BLANDA, DC. Prod. V. 32 ; Clark. Comp. Ind. 25. (*V. blandula*, Clark. Comp. Ind. 26 ; *V. Andersonii*, Clark. Comp. Ind. 27).

HAB. Rather frequent in the grass jungles along choungs and deserted toungyas of the Pegu Yomah and Martaban ; Upper Tenasserim.—Fl. Fr. Jan., Febr.

V. Andersonii (Birma. Griff. 3099) has the receptacle densely hirsute, but in *V. blanda*, as well as in *V. blandula*, the same is also hispid, although much less so.

12. V. SCANDENS, DC. Prod. V. 32 ; Clark. Comp. Ind. 26. (*Decaneuron obovatum*, DC. Prod. V. 67 ; Miq. Fl. Ind. Bat. II. 21 ; *V. vagans*, DC. Prod. V. 32 ; Clark. Comp. Ind. 26).

HAB. Pegu (R. Scott) ; Ava hills, up to 4000 ft. elevation.—Fl. Fr. CS.

13. V. VOLKAMERIÆFOLIA, DC. Prod. V. 32 ; Bedd. Fl. Sylv. Madr. t. 225. (*V. acuminata*, DC. Prod. V. 32, non Less. ; Clark. Comp. Ind. 22 ; *V. Punduana*, DC. Prod. V. 32 ; *V. cuspidata*, Buck Ind. Cand. II. p. V).

HAB. Not unfrequent in the drier hill and the hill-eng-forests of Martaban, at 2—4000 ft. elevation ; Ava, Khakyen hills (J. Anderson).—Fl. Febr., March ; Fr. April.

14. V. KURZII, Clark. Comp. Ind. 24.

HAB. Not unfrequent in the drier hill-forests of Martaban east of Toungboo, at 2—3000 ft. elevation, often springing up amongst the shrubs of poonzohs.—Fl. March ; Fr. April.

15. V. ARBOREA, Ham. in Trans. XIV. (1825) 215 ; DC. Prod. V. 22 ; Clark. Comp. Ind. 23. (*V. Javanica*, DC. Prod. V. 22 ; *Eupatorium Javanicum*, Bl. Bydr. (1826) 903 ; *V. Blumeana*, DC. Prod. V. 22).

HAB. Tenasserim (Helf. 3103).

16. V. ELÆAGNIFOLIA, DC. Prod. V. 22 ; Clark. Comp. Ind. 24.

HAB. Upper Tenasserim, Moulmein. (Wall. ; Falc.) and adjoining Siamese provinces (Teysmann).—Fl. Jan., March ; Fr. HS.

17. V. CALYCINA, Wall. Cat. 2924 ; DC. Prod. V. 60 ; Clark. Comp. Ind. 9.

HAB. Prome (Wall.).

18. V. ANTHELMINTHICA, Willd. sp. pl. III. 1634 ; DC. Prod. V. 61 ; Clark. Comp. Ind. 10. (*Conyza anthelminthica*, L. sp. pl. 1207 ; *Serratula anthelminthica*, Roxb. Fl. Ind. III. 405).

HAB. Ava, Taongdong (Wall.).

Tricholepis, DC.

1. T. KARENSIUM, Kurz in Journ. As. Soc. Beng. 1872. 318 ; Clark. Comp. Ind. 238 (*Karensis*).

HAB. Martaban hills, Yoonzeleen (Brandis, O'Riley) ; Karenee hills (Rev. F. Mason).

Carthamus, L.

1. C. TINCTORIUS, L. sp. pl. 1162; Roxb. Fl. Ind. III. 409; Bot. Reg. t. 170; DC. Prod. VI. 612; Clark. Comp. Ind. 244.

HAB. Much cultivated in Prome District.—Fl. March, April.

There are two forms in cultivation, the one with almost entire leaves and involucral leaves and very slightly and shortly spiny, and the other, coming near *C. oxyacantha*, armed with long spreading spines.

Cnicus, L.

Conspectus of Species.

* *Corolla limb bell-shaped, 5-cleft to the middle. Flower-heads bisexual, the inner involucral bracts not in any way dilated at the tips, but terminating in spines.*

Leaves white-tomentose beneath, pinnatifid, spiny; flower-heads large, hemispherical, arachnoid-woolly, ... *C. eriophorus.*

* * *As preceding section, but the inner involucral bracts dilated into a terminal appendage.*

Slender but stiff; leaves narrow, entire or somewhat sinuate-lobed, shortly spiny, usually whitish tomentose beneath; flower-heads rather small, not leafy-involucred at the base, long-peduncled, ... *C. Chinensis.*

1. C. ERIOPHORUS, Hoffm. Deutsch Fl. 286; Roth Tent. Fl. germ. II. 286; Clark. Comp. Ind. 217, (*Cirsium eriophorum*, Scop. Flor. Carn. II. 130; DC. Prod. VI. 638; Koch. Syn. Fl. Germ. 743; *Carduus eriophorus*, L. sp. pl. 1153; Jacq. Austr. t. 171; Engl. Bot. t. 386).

Var. β. INVOLUCRATUS, Clark. Comp. Ind. 217 (*Cirsium involucratum*, DC. Prod. VI. 639), leaves above covered with sharp sometimes spine-like bristles; involucre-bracts glabrescent; florets purple.

HAB. Var. β. Karenee country (O'Riley); Ava, Kakhyen hills east of Bhamo (J. Anderson).—Fl. August, September.

2. C. CHINENSIS, Clark. Comp. Ind. 219. (*Sinensis*). (*Cirsium Chinense*, Gard. and Champ. in Hook. Kew. Journ. Bot. I. 323; Bth. Fl. Hongk. 168).

HAB. Ava, hills east of Bhamo.

Saussurea, DC.

Conspectus of Species.

Leaves lyrate with a deltoid or hastate end-lobe, the upper cauline ones often entire or lobed, tomentose beneath; flower-heads long-peduncled, laxly racemose and panicled, the involucre-bracts nigrescent, often blunt and erose-toothed, *S. d*[illegible].

Leaves pinnatifid, also the cauline ones, the end-lobe rather elongate, tomentose beneath; flower-heads shortly peduncled or almost sessile, clustered and forming an elongate contracted almost raceme-like panicle, the involucre-bracts greyish villous, acute, ... *S. Peguensis.*

1. S. DELTOIDEA, Clark. Comp. Ind. 235 (*Aplotaxis deltoidea*, DC. Prod. VI. 541; *Aplotaxis nivea*, DC. Prod. VI. 541.)

Var. *α*. VERA, Clark. Comp. Ind. 236 (incl. var. *β. nivea*, Clark. l. c.), flower-heads long-peduncled, laxly racemose, larger, the involucre-bracts nearly entire at the tips; upper leaves entire or the end-lobe deltoid and large.

Var. *β*. POLYCEPHALA, Clark. Comp. Ind. 236, flower-heads smaller, shorter peduncled, and more crowded, laxly racemose and panicled, the involucre-bracts blunt and erose-toothed; upper leaves or their end-lobe sagittate.

HAB. Var. *α*. Martaban on the Nattoung hill (Rev. F. Mason); var. *β*. frequent in open and grassy places in the drier hill-, especially the pine-forests on the highest ridges of the Martaban hills, at 6000—7100 ft. elevation.—Fr. March.

2. S. PEGUENSIS, Clark. Comp. Ind. 235.

HAB. Karen hills (O'Riley).

Dicoma, Cass.

1. D. TOMENTOSA, Cass. Bull. phil. 1818.; Dict. XIII. 195 and XLVII. 503; DC. Prod. VII. 36; Clark. Comp. Ind. 36.—(*D. lanuginosa*, DC. Prod. VII. 36; Wight Icon. t. 1140).

HAB. Ava, limestone-hills about Segain (Wall.).—Fl. Fr. Nov.

N. B. *Hochstetteria Schimperi*, Clark. Comp. Ind. 246, non DC. = *Pegolettia Senegalensis*, Cass. I cannot see in what *Hochstetteria* and *Pegolettia* do differ, and still less can I understand how they can be placed almost at the opposite ends of the order, considering that two of the *Pegolettias* have the corolla even more bilabiate than are those of *Hochstetteria Schimperi*, as figured by A. Pyr. De Candolle.

Leucomeris, Don.

Conspectus of Species.

Flower-heads on short slender peduncles or almost sessile, in peduncled corymbs from the axils of the upper-leaves and terminal; leaves almost coriaceous, white-tomentose beneath, ... *L. spectabilis.*

Flower-heads solitary, in dense terminal umbel-like corymbs, the involucral bracts gradually shorter and passing into the thick short densely imbricate-bracted peduncle; leaves membranous, glabrous, ... *L. decora*

1. L. DECORA, Kurz in Journ. As. Soc. Beng. 1872. 317; Clark. Comp. Ind. 245.

HAB. Not unfrequent in the eng- and dry forests of the Prome District.—Fl. March; Fr. May.

Ainsliæa, DC.

Conspectus of Species.

× Leaves narrowed at the base and decurrent wing-like on the petiole.

Sparingly pilose, the flowering stems more or less sessile-leaved; leaves membranous obscurely crenate-toothed; flower-heads sessile or peduncled, in lax spikes or diffuse narrow panicles, ... *A. pteropoda.*

× × Leaves more or less cordate at the base, the petiole not winged.

Flowering stem leaved, the leaves thin membranous, sinuate-toothed, long-petioled, sparingly pilose or almost glabrous; flower-heads sessile, or peduncled, in racemes or panicles, ... *A. aptera.*

Flowering stem radical and almost scapiform and leafless; leaves almost coriaceous, entire, hirsute, often glabrescent above, densely villous-fringed; flower-heads peduncled, in diffuse panicles, ... *A. Brandisiana.*

1. A. PTEROPODA, DC. Prod. VII. 14; Clark. Comp. Ind. 246.

Var. α. GENUINA (*A. pteropoda β. lobelioides*, Clark. Comp. Ind. 246; *A. pteropoda*, DC. l. c.; *A. Silhetensis*, Clark. in Linn. Journ. XIV. 411), flower-heads sessile, usually clustered, forming a simple elongate lax spike.

Var. β. EFFUSA, Clark. l. c., flower-heads slenderly peduncled, almost racemose, forming a spreading narrow panicle.

HAB. Var. α. frequent in open grassy places of the drier hill-, especially the pine-forests, and on the hill-pastures of the higher ridges of the Martaban hills, at 5000—7100 ft. elevation; Upper Tenasserim, top of Moolee (Rev. Parish).—Fl. Fr. March.

2. A. BRANDISIANA, Kurz in Journ. As. Soc. Beng. 1872. 318; Clark. Comp. Ind. 247.

HAB. Not unfrequent along choungs in the damp hill-forests of the Martaban hills, at 2000—4000 ft. elevation.—Fl. March.

Gerbera, Gron.

1. G. PILOSELLOIDES, Cass. Dict. XVIII. 461; DC. Prod. VII. 16; Bth. Fl. Hongk. 191. (*Arnica piloselloides*, Linn. Amoen. VI. 103; *G. ovalifolia*, DC. Prod. VII. 17; Clark. Comp. Ind. 249).

HAB. Karenee hills (Rev. F. Mason.)

The Cape-plant grows on sand-hills and has larger flower-heads and shorter, more robust scapes.

Cichorium, L.

*1. C. INTYBUS, L. sp. pl. 1142; Engl. Bot. t. 539; DC. Prod. VII. 84; Koch Syn. Fl. Germ. 357; Clark. Comp. Ind. 250.

Var. α. GENUINA, floral leaves from a broader half-stem-clasping base, lanceolate, the lower leaves often runcinate.

Var. β. ENDIVIA, Clark. Comp. Ind. 250. (*C. Endivia*, L. sp. pl. 1142; DC. Prod. VII. 84; Koch Syn. Fl. Germ. 357), floral leaves broadly ovate, half-stem-clasping with a cordate base, the lower leaves usually only sinuate.

HAB. Var. β. cultivated in gardens of the drier parts of Burma, as Prome.—Fl. CS.

Crepis, L.

1. C. JAPONICA, Bth. Fl. Hongk. 194. (*Prenanthes Japonica*, L. Mant. 107; Thbg. Fl. Jap. 302; *Youngia Japonica*, DC. Prod, VII. 194;

Prenanthes lyrata, Thbg. Fl. Jap. 303; *Crepis lyrata*, Clark. Comp. Ind. 253; *Youngia Mauritiana*, DC. Prod. VII. 192; *Prenanthes procumbens*, Roxb. Fl. Ind. III. 404: *Youngia Thunbergiana*, DC. Prod. VII. 192; *Youngia runcinata*, DC. Prod. VII. 192; *Youngia napifolia*, DC. Prod. VII. 193; Wight Icon. t. 1147; *Youngia ambigua*, DC. Prod. VII. 193; *Youngia Poosia*, DC. Prod. VII. 193; *Youngia striata*, DC. Prod. VII. 193; *Prenanthes striata*, Bl. Bydr. 835).

HAB. Frequent in garden-land and in toungyas under cultivation, in betel-nut-gardens, &c., of the Martaban hills; also Ava-hills, apparently frequent.—Fl. Fr. Jan.—March.

Hieracium, L.

1. H. SILTHETENSE, DC. Prod. VII. 218; Clark. in Journ. Linn. Soc. XIV. 411. and Comp. Ind. 257.

HAB. Tenasserim (Helf. 3369).

Lactuca, L.

Conspectus of Species.

Stout annual; leaves runcinate and spinulose-toothed, half-stem-clasping with a sagittate base; panicle large, furnished with auricled stem-clasping bracts; flower-heads nearly ½ in. long, ... *L. Scariola.*

Slender annual; leaves linear, entire or runcinately lobed, sessile with a sagittate base; panicle lax and corymb-like, poor, the bracts subulate, small; flower-heads rather broad, 3—3½ lin. long, ... *L. polycephala.*

1. L. SCARIOLA, L. sp. pl. 1119; DC. Prod. VII. 137; Hayn. Arzn. Gew. I. t. 46; Koch Syn. Fl. Germ. 369; Clark. Comp. Ind. 263.

Var. *a.* GENUINA, panicle pyramidal.

*Var. *β.* SATIVA, Clark. Comp. Ind. 263 (*L. sativa*, L. sp. pl. 1118; DC. Prod. VII. 138; Hayn. Arzn. Gew. V. t. 30; Koch Syn. Fl. Germ. 369), panicle fastigiate.

HAB. Cultivated in the drier parts of Burma, as in Prome.—Fl. CS.; Fr. HS.

2. L. POLYCEPHALA, Bth. Clark. Comp. Ind. 272. (*Ixeris polycephala*, Cass. Dict. XXIV. 50; DC. Prod. VII, 151; *Ixeris fontinalis*, DC. l. c.)

HAB. Ava, Tapan near Bhamo (J. Anderson).—Fr. Feb.

N. B. *Lactuca bialata*, Griff. Not. Dicot. 1854. 247, = *L. brevirostris*, Champ. (1852).

Prenanthes, L.

Conspectus of Species.

× Leaves pinnatifid to pinnate.

Annual, almost glabrous; panicle lax and spreading, ... *P. Khasiana.*

× × Leaves simple.

सन्दर्भ ग्रन्थ REFERENCE BOOK

Leaves sagittate, the petiole long and broadly leafy-winged and sagittately or auricular-dilated at the base; panicle lax, the flower-heads nearly ½ in. long, nodding, on slender bracted peduncles, .. *P. alata.*

Leaves, at least the cauline ones, sessile with a sagittate base; flower-heads long and slenderly peduncled, forming a narrow terminal panicle, ... *P. Hothæ.*

1. P. ALATA, Hf. and Thoms.; Clark. Comp. Ind. 274.

HAB. Grassy open places in the drier hill-forests of the higher ridges of the Martaban hills, at 5—6000 ft. elevation.

2. P. HOTHÆ, (*Sonchus Hotha*, Clark. Comp. Ind. 276).

HAB. Ava, Khakyen hills east of Bhamo (J. Anderson).—Fl. Fr. Aug.

The base of the involucral bracts becomes slightly thickened and indurated in fruit, but the inflorescence and the narrow few- and apparently purple-flowered flower-heads are those of a *Prenanthes*, not of *Sonchus*.

Sonchus, L.

Conspectus of Species.

* *Involucral bracts glabrous or puberulous, but not glandular-pilose or hispid.*

Achenes much compressed, 3-ribbed on both sides, the ribs perfectly or almost perfectly smooth; leaves usually runcinnate-pinnatifid, ... *S. asper.*

Achenes compressed, the ribs marked with transverse asperities, and muricate; leaves runcinnate-pinnatifid or simple, ... *S. oleraceus.*

* * *Involucral bracts and peduncles glandular-hispid or glandular-pilose.*

Achenes hardly compressed, the ribs thick and transversely muricate; leaves more or less slightly runcinnate, the upper ones simple, ... *S. arvensis.*

1. S. OLERACEUS, L. sp. pl. 1116; Roxb. Fl. Ind. III. 402; Hayn. Arzn. Gew. II. t. 48; Fl. Dan. t. 682; Koch Syn. Fl. Germ. 371; Clark. Comp. Ind. 275. (*S. ciliatus*, Lamk. Fl. Franc. II. 87; DC. Prod. VII. 185; Wight Icon. t. 1141; *S. Wallichianus*, DC. Prod. VII. 185).

HAB. Ava.—Fr. June.

2. S. ASPER, Vill. Delph. III. 158; Hayn. Arzn. Gew. II. t. 48; Koch Syn. Fl. Germ. 371; Clark. Comp. Ind. 275. (*S. fallax*, Wallr. Sched. 432; Fl. Dan. t. 893; DC. Prod. VII. 185).

HAB. Burma (*teste* Clarke).

3. S. ARVENSIS, L. sp. pl. 1116; Engl. Bot. t. 674; DC. Prod. VII. 187; Koch Syn. Fl. Germ. 371; Clark. Comp. Ind. 276. (*S. Orixensis*, Roxb. Fl. Ind. III. 402; *S. Wightianus*, DC. Prod. VII. 187; Wight Icon. t. 1142).

HAB. Not unfrequent in cultivated and rubbishy places, in toungyas and betel-nut-gardens, etc., also along river-banks, of the Martaban hills; Ava, Bhamo (J. Anderson).—Fl. April, May; Fr. June.

सन्दर्भ ग्रन्थ REFERENCE BOOK

Microrhynchus, Less.

Conspectus of Species.

Leaves narrow, slightly-lobed or entire; flowering stems erect; achenes strongly 4—5 ribbed, the ribs smooth, ... *M. acaulis.*

Leaves pinnatifid with the lobes all rounded; flowering stems divaricate and much dichotomously branched; achenes strongly 10—12-ribbed, the ribs transversely wrinkled, ... *M. asplenifolius.*

1. M. acaulis (*Prenanthes acaulis*, Roxb. Fl. Ind. III. 403; *Youngia acaulis*, DC. Prod. VII. 193; *Prenanthes* sp. Griff. Not. Dicot. 251. t. 469; *M. glaber*, Wight Icon. t. 1145; *Lactuca glabra*, DC. in Wight Contr. 26 and Prodr. VII. 135; Clark. Comp. Ind. 272).

Hab. Frequent in savannahs and other grassy places, along and in the bed of stony choungs, etc., all over Burma, from Ava and Martaban down to Tenasserim.—Fl. March, April; Fr. April, May.

2. M. asplenifolius, DC. Prod. VII. 181; Clark. Comp. Ind. 276. (*Prenanthes asplenifolia*, Roxb. Fl. Ind. III. 404).

Hab. Not unfrequent on dried up beds of the Irrawadi and in fields in Pegu.—Fl. Jan.

De Candolle cites *Hieracium dichotomum*, Roxb. Fl. Ind. III. 404; there is no such name in Roxburgh's book, and *Prenanthes asplenifolia* was no doubt meant.

CAMPANULACEÆ.

Conspectus of Genera.

Subord. 1. *CAMPANULEÆ.* Corolla regular, more or less bell-shaped to almost rotate. Anthers free. Ovary 2—3—5-celled.

* *Capsule opening by an apical opercle-like disk.*

Sphenoclea. Stigma shortly 3-lobed. Ovary 2-celled.—Glaucous herbs. Flowers in dense spikes.

* * *Capsule dehiscing by pores or valves.*

× Stigma lobed.

+ Fruit a capsule. Corolla bell-shaped.

Wahlenbergia. Capsule dehiscing by 3—5 apical valves bearing the septa. Herbs.

Campanula. Capsule opening laterally by 3 or 5 pores.

+ + Fruit a berry.

Campanumœa. Corolla bell-shaped. Berry supported by the adherent large calyx-lobes.—Twining herbs, the juice milky. Flowers yellowish.

Cyclodon. Corolla shallowly bell-shaped. Calyx-lobes linear, entire or laciniate, adnate to the base of the ovary or free. Erect annuals, the juice milky. Flowers small, white.

Pentaphragma. Corolla persistent, the tube short. Stigma shortly 3-lobed. Calyx-lobes broad and blunt. Succulent herbs. Flowers in one-sided bracted racemes.

× × Stigma capitate.

Cephalostigma. Corolla almost rotate, deeply cleft, the lobes linear. Capsule dry. Delicate herbs.

Subord. 2. *LOBELIEÆ.* Corolla irregular, usually more or less slit on the back. Anthers united round the style. Ovary 2-celled.

* *Anthers united round the style. Ovary 2-celled. (Eu-Lobelieae).*

Pratia. Berry indehiscent. The 2 upper anthers terminated by a single bristle. Herbs.

Lobelia. Capsule herbaceous or membranous, dehiscent. The upper 2, or all the anthers bearded. Small or tall herbs.

* * *Anthers free. Ovary 1 or 2-celled.* (*Goodeniaceae*).

Scævola. Corolla 1- or 2-lipped, posteriorly split to the base. Soft-wooded trees or shrubs.

Sphenoclea, Gærtn.

1. S. Zeylanica, Gærtn. Fruct. I. 183. t. 24; Roxb. Fl. Ind. ed. Wall. II. 106; Miq. Fl. Ind. Bat. II. 569.—(*Sph. Pongatium*, DC. Prod. VII. 548; Wight Ill. t. 138; *Sph.* sp. Griff. Not. Dicot. 276).

Hab. Frequent in agrarian lands, especially in wet fields, along river-banks, etc., all over Burma.—Fl. Fr. C. and HS.

Wahlenbergia, Schrad.

1. W. gracilis, DC. Prod. VII. 433; Bth. Fl. Austr. IV. 137; Smith Exot. Bot. t. 45; Bot. Mag. t. 691.—(*W. agrestis*, DC. l. c. 434; Wight Icon. t. 1175; Hf. and Th. in Linn. Proc. II. 21, cum syn.; *Campanula dehiscens*, Roxb. Fl. Ind. ed. Wall. II. 96; *Campanula agrestis*, Wall. in Roxb. Fl. Ind. II. 97).

Hab. Not unfrequent in fallow agrarian lands of the Prome and Irrawaddi Districts.—Fr. April.

Campanula, Fuchs.

1. C. canescens, Wall. Cat. 1289; DC. Prod. VII. 473. (*Cephalostigma spathulatum*, Thwait. Ceyl. Pl. 422).

Hab. Frequent on brick-work of old pagodas, on rock-walls, &c., of the dry and eng forests of Prome, Pegu, and Martaban.—Fl. Febr.—April.

Campanumœa, Bl.

1. C. Javanica, Bl. Bydr. 726; Hf. and Th. in Linn. Proc. II. 9. (*Codonopsis Javanica*, Hf. and Th. in Ill. Him. Plant. t. 16. B; *Codonopsis cordata*, Hassk. Retz. I. 9; Miq. Fl. Ind. Bat. II. 566, var. fol. subt. sparse hirsutis).

Hab. Martaban, Karen hills (O'Riley).

Cyclocodon, Griff.

Conspectus of Species.

Calyx-segments removed from the ovary by means of the ovary-stalk, *C. parviflorum.*
Calyx-segments halfway adnate to the sessile ovary, ... *C. lancifolium.*

1. C. LANCIFOLIUM, Kurz in Flora 1872. 303. (*Campanula lancifolia*, Roxb. Fl. Ind. ed. Wall. II. 96; *C. truncatum*, Hf. and Th. in Linn. Proc. II. 18; *Codonopsis truncata*, Wall. Cat. 1301; DC. Prod. VII. 423; *Codonopsis albiflora*, Griff. Not. Dicot. 279; *C. distans*, Griff. Icon. Dicot. t. 481; *Codonopsis leucocarpa*, Miq. Fl. Ind. Bat. II. 565).

HAB. Not unfrequent on shady moist rock-walls along choungs, in the tropical forests of the Pegu Yomah, Martaban, and Chittagong down to Tenasserim, up to 3000 ft. elevation; also Ava, Pingee rocks in the Irrawaddi, just above the images (Wall.).—Fl. Fr. Febr., March.

Pentaphragma, Wall.

1. P. BEGONIÆFOLIUM, Wall. Cat. 1313; DC. Prod. VII. 495. (*Phyteuma begonifolium*, Roxb. Fl. Ind. ed. Wall. II. 108; Jack in Mal. Misc. in Hook. Bot. Misc. I. 277. t. 57).

HAB. Tenasserim, Mergui (Griff.).

Cephalostigma, A. DC.

1. C. PANICULATUM, A. DC. Prod. VII. 421.

HAB. Common on laterite and calcareous grounds in the eng and dry forests all over Prome, Pegu, and Martaban.—Fl. Decb.—Febr.; Fr. Jan.—March.

N. B.—*Wahlenbergia perotifolia*, WA., Wight Icon. t. 842, appears to me to belong to *C. hirsutum*, not to the above, as Hooker and Thomson state.

Pratia, Gaud.

1. P. NUMMULARIA, Bth. (*Lobelia nummularia*, Lamk. Dict. III. 589; *Piddingtonia nummularia*, DC. Prod. VII. 341; *Lobelia begonifolia*, Wall. in Asiat. Res. XIII. 377; Roxb. Fl. Ind. ed. Wall. II. 115; *Pratia begonifolia*, Lindl. Bot. Reg. t. 1373).

HAB. Martaban hills, Yoonzeleen plateau, at 2500 ft. elevation (Dr. Brandis).

Lobelia, L.

Conspectus of Species.

* *Small erect procumbent or creeping herbs. Flowers solitary or in spurious racemes, small, 1—4 lin. long.*

× Stems terete.

Calyx puberulous; flowers solitary, axillary, ... *L. Zeylanica.*

× × Stems angular.

Stems 3-gonous; calyx quite glabrous; flowers solitary and axillary, or more usually in spurious racemes, ... *L. trigona.*

Stems 4-gonous; flowers in poor racemes; calyx small, ... *L. Griffithii.*

* * *Robust erect simple or branched herbs, 2—5 ft. high. Flowers ¾—1 in. long, in leafy-bracted terminal simple or panicled racemes.*

All parts, also the white corolla, quite glabrous; capsule glabrous, ...*L. Wallichiana.*
All parts, also the rose-coloured corolla and the capsule, velvety puberulous, . . *L. rosea.*

1. L. ZEYLANICA, L. sp. pl. ed. 1. 932; Wall. in Roxb. Fl. Ind. II. 113.

Var. *α.* GENUINA, (*L. Lobbiana*, Hf. and Th. in Linn. Proc. II. 28), an aquatic form, the branches more or less ascending or erect, up to 1½ ft. long; all parts more robust; leaves up to 2 in. long; corolla 4—5 lin. long.

Var. *β.* AFFINIS, (*L. affinis*, Wall. Cat. 1311; DC. Prod. VII. 360; *L. succulenta*, Bl. Bydr. 728; DC. l. c. 373), creeping or prostrate, all parts smaller; leaves shorter petioled, ½—1 in. long; corolla only 2 lin. long.

HAB. Var. *α* only, frequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Fr. Febr., March.

2. L. TRIGONA, Roxb. Fl. Ind. ed. Wall. II. 111. (*L. subincisa*, Wall. Cat. 1310; DC. Prod. VII. 367; *L. subracemosa*, Miq. in Fl. Ind. Bat. II. 576).

Var. *α.* TRIGONA, (*L. trigona*, Roxb. l. c. etc.), all parts more succulent, the floral leaves more ovate; peduncles thicker and flowers much larger.

? Var. *β.* STIPULARIS (*L. stipularis*, Wall. Pl. As. rar. II. 43; *L. trialata*, Ham. in Don Prod. Fl. Nep. 157; DC. Prod. VII. 360; *L. micrantha*, Hook. Exot. Fl. I. t. 44?) slender, erect, branched, all parts less succulent; peduncles filiform; flowers minute, the floral bracts often very narrow. Probably a distinct species.

HAB. Frequent in swampy grass-land, borders of tanks, in wet paddy fields, and more especially on the banks of rivers, all over Burma; var. *β.* is a hill-form (or species?) of Martaban; also Prome, and Ava, on Taongdong.—Fl. Fr. Octob.—Dec.

Vatke (in Linnæa XXXVI. 718) identifies *L. trigona* of Roxburgh with *L. alsinoides* of Lamarck; the description of the latter, however, does not in the least agree with the Indian plant. *L. stipularis*, Wall., will take precedence, if it is not specifically different, but I am at present inclined to believe it may be different.

3. L. GRIFFITHII, Hf. and Th. in Linn. Proc. II. 28.

Var. *α.* GENUINA, leaves reduced to scales; flowers only a line long.

Var. *β.* DOPATRIOIDES, Kurz in Flora 1872. 302 (*L. dopatrioides*, Kurz in Journ. As. Soc. Beng. 1870. 77; *L.* sp. Griff. Not. Dicot. 281), leaves developed; flowers nearly twice the size.

HAB. In wet fields and swampy pastures of Pegu, near Rangoon (R. Scott); var. *β.* in long grass along rivers of Arracan, frequent; Tenasserim, Attaran (Brandis); Mergui (Griff.).—Fl. Fr. Octob.

4. L. WALLICHIANA, Hf. and Th. in Linn. Proc. II. 29 (*L. pyramidalis* var. *β.* DC. Prod. VII. 381).

Hab. Rare on wet sandstone-walls in the tropical forests of the Pegu Yomah; more frequent in the damp hill-forests and in open hill-pastures of the Martaban hills east of Tounghoo, also Ava, Khakyen hills.—Fl. Jan.—March; Fr. March, April.

5. L. rosea, Wall. in Roxb. Fl. Ind. ed. Wall. II. 115 and Plant. As. rar. II. 42. t. 152; DC. Prod. VII. 381. (*L. trichandra*, Wight Icon. t. 1171).

Hab. Martaban, Karennee hills (Revd. F. Mason); Ava, Khakyen hills (J. Anderson).—Fl. March.

Scævola, L.

Conspectus of Species.

Glabrous or silky-hairy, long silky villous in the leaf-axils; berries velvety or pubescent, ... *S. sericea.*

Glabrous, not or slightly silky-villous in the leaf-axils; berries glabrous, . . *S. Kœnigii.*

1. S. Kœnigii, Vhl. Symb. III. 36; DC. Prod. VII. 505; Bot. Mag. t. 2732; Bth. Fl. Austr. IV. 86.—(*S. Taccada*, Roxb. Fl. Ind. ed. Wall. II. 146; Wight Ill. t. 137; Griff. Not. Dicot. 275).

Hab. Frequent along the sea-coast, especially on coral-banks and beaches, of Tenasserim and the Andamans.

STYLIDIEÆ.

Stylidium, Swartz.

Conspectus of Species.

Leaves palmatinerved, almost rosulate, the stems terete; flowers white, in dichotomous leafless or few-leaved radical glandular-puberulous spikes or panicles, . . *S. uliginosum.*

Leaves 1-nerved, scattered, the stems angular; flowers rose-coloured, in a simple stiff glabrous spike, ... *S. roseum.*

1. S. uliginosum, Swartz in Magaz. Nat. Gesch. Berl. 1807. 52. t. 2. f. 4; DC. Prod. VII. 336; Kurz in Flora 1872. 303.—(*S. Kunthii*, Wall. Cat. 3759; DC. Prod. VII. 335; *S. Brunonis*, Griff. Not. Dicot. 275; *S. tenellum*, Swartz Magaz. Naturf. Ges. Berl. 1807. 51. t. 2. f. 3; DC Prod. VII. 336, a reduced state).

Hab. Frequent in swampy grass-lands, swamps, etc., of the alluvial and diluvial plains of Pegu; also Chittagong and Martaban down to Tenasserim as far south as Mergui.—Fl. Sept.—Nov.; Fr. Nov., Dec.

2. S. roseum, Kurz in Journ. As. Soc. Beng. 1876. 137.—(*S. tenellum*, Kurz in Flora 1872. 304, non Sw.).

Hab. Swampy grass-land of Chittagong, rare.—Fl. Octob.

VACCINIACEÆ.

Conspectus of Genera.

* *Calyx jointed with the pedicel.*

Vaccinium. Calyx terete. Corolla various, from large and tubular and bell-shaped to small and urn-shaped. Anthers 8 or 10, the tubes short or long.

* * *Calyx continuous with the pedicel.*

Pentapterygium. Calyx 5-winged. Rest as in *Vaccinium.*

Vaccinium, L.

Conspectus of Species.

Subg. 1. *Agapetes*, Don. Flowers large, rarely small; pedicels more than an inch long, thickened upwards and often cup-shaped-dilated at the apex. Epiphytical shrubs.

* *Corolla large, ½—2½ in. long, tubular to bell-shaped, slightly curved or straight.*

O Filaments more than ½ in. long.

Anthers short, connate; corolla tubular, slightly curved; racemes glabrous, .. *V. macrostemon.*

O O Filaments thick and short, only 1—2 lin. long.

× Calyx and pedicels glandular-hirsute.

Corolla glabrous, tubular or campanulate-tubular; anthers without bristles between the tubes, ... *V. verticillatum.*

× × Calyx and pedicels quite glabrous.

+ Anthers without a pair of reflexed or uncinate bristles between their tubes.

Anthers exserted; nerves of leaves uniting into a marginal nerve; corolla 2 in. long or longer, ... *V. variegatum.*

As preceding, but corolla only ½ the size, scarlet, ... *V. Roylei.*

Anthers included; nerves of leaves not uniting within the margin, ... *V. miniatum.*

+ + Anthers with a pair of bristles between their tubes at the base or halfway up.

Corolla tubular bell-shaped; calyx-toothed, the teeth subulate-lanceolate, .. *V. odontocerum.*

Corolla bell-shaped, wide; calyx-limb cupular, with sinuate acute teeth, .. *V. campanulatum.*

* * *Flowers rather small or small, ½ in. to 2 lin. only long, shortly or elongate-urn-shaped.* (*Corallobotrys*, Hf.).

Corolla ½ in. long, elongate-urceolate; flowers in peduncled terminal racemes, .. *V. auriculatum.*

Corolla 2 lin. long, urn-shaped; flowers in short umbel-like racemes arising laterally from the branches, ... *V. acuminatum.*

Subg. 2. *Epigynium*, Klotsch. Flowers small, urn-shaped or urceolate-campanulate; pedicels short, slender, not or only at the very joint thickened. Racemes one-sided. Berries globose.

* *Epiphytical shrub. Bracts deciduous.*

Branchlets pubescent; corolla villous inside at the mouth; anthers with 2 bristles at the tubes, ... *V. pumilum.*

* * *Terrestrial shrubs or trees. Bracts deciduous.*

All parts, also the pedicels, corolla, and calyx, glabrous, ... *V. Donianum.*

Young shoots and racemes (sometimes also the calyx) pubescent; corolla glabrous, .. *V. exaristatam.*

1. V. MACROSTEMON, Kurz in Journ. As. Soc. Beng. 1873. 85.

HAB. Not unfrequent in the hill-forests (especially the drier ones) of Martaban, at 4000 to 6000 ft. elevation.—Fl. March.

2. V. VERTICILLATUM, Kurz in Journ. As. Soc. Beng. 1873. 83, non Wight (*Agapetes verticillata*, D. Don Gen. Syst. III. 862; DC. Prod. VII. 554).

Var. α. GENUINUM, (*Thibaudia obliqua*, Griff. Icon. Dicot. t. 515), corolla only ¾ in. long; flowers in shortly peduncled umbel-like-racemes.

Var. β. ELEGANS, but the flowers solitary or by 2—3 in the axils of the leaves; leaves usually broader.

? Var. γ. GLANDIFLORUM, corolla 1½ in. long; flowers in short-peduncled or sessile umbel-like racemes, occasionally also solitary.

HAB. Var. β. in the upper dry forests on the Kambala ridges of the Pegu Yomah, at 2800 to 3000 ft. elevation; var. γ in the hill-forests of Martaban and Tenasserim as far south as Tavoy, at 4000 to 7000 ft. elevation.—Fl. March.

3. V. VARIEGATUM. Kurz in Journ. As. Soc. Beng. 1873. 84 (*Agapetes variegata*, Don Gen. Syst. III. 862; *Ceratostemma variegatum*, Roxb. Fl. Ind. II. 413; Griff. Icon. Dicot. t. 502; *Thibaudia macrantha*, Hook. Bot. Mag. t. 4566).

HAB. Moulmein, Kola mountains (Lobb).

4. V. ROYLEI (*Thibaudia variegata*, Royle Ill. Him. Pl. t. 79. f. 1; *V. variegatum β. parviflora*, Kurz in Journ. As. Soc. Beng. 1873. 84).

HAB. Frequent in the hill-forests of Martaban, at 3000 to 5000 ft. elevation.—Fl. March; Fr. April.

5. V. MINIATUM, Kurz in Journ. As. Soc. Beng. 1873. 85. (*Ceratostemma miniatum*, Griff. Icon. Dicot t. 504).

HAB. Burma, probably Ava (Griff. 3475).

6. V. ODONTOCERUM, Wight Icon. t. 1187 (*Ceratostemma angulatum*, Griff. Dicot. Icon. t. 503).

HAB. Ava, Patkaye ranges (Griff.).—Fl. March.

7. V. CAMPANULATUM, Kurz in Journ. As. Soc Beng. 1873. 85.

HAB. In the stunted hill-forests on the top of Nattoung, Martaban hills, at about 7000 ft. elevation.—Fl. March.

8. V. AURICULATUM (*Thibaudia auriculata*, Griff. Dicot. Icon. t. 508).

HAB. In the hill-forests on the Taipo mountains, Martaban, above 4000 ft. elevation (Dr. Brandis).—Fl. March.

9. V. ACUMINATUM (*Agapetes acuminata*, D. Don Gen. Syst. III. 862; *Epigynium acuminatum*, Klotzsch in Linn. XXIV. 51; Bot. Mag. t. 5010; *Corallobotrys acuminata*, Hf. and Bth. Gen. pl. II. 575).

HAB. Burma, probably Moulmein hills (Griff. 3471).

10. V. PUMILUM, Kurz in Journ. As. Soc. Beng. 1873. 85.

? Var. β. CUNEATUM, leaves of thinner texture, obovate-cuneate to cuneate, rounded or blunt at the apex; flowers longer pedicelled.

HAB. Epiphytic in the drier hill-forests of the Martaban hills east of Tounghoo, at 5000 to 6000 ft. elevation; var. β. in the same forests on Taipo hill, at 4000 ft. elevation (Dr. Brandis).—Fl. March.

11. V. DONIANUM, Wight Icon. t. 1191; Walp. Ann. I. 478 (*Epigynium Donianum*, Klotzsch in Linn. XXIV. 51.; *V. affine*, Wight Icon. t. 1190).

Var. α. GENUINUM, anthers with a pair of bristles between the tubes; pedicels longer.

Var. β. EXARISTATUM, anthers without bristles; pedicels longer.

HAB. Frequent in the drier hill-, especially the pine-forests of the Martaban hills east of Toungboo, at 3000 to 6000 ft. elevation.—Fl. Jan., Febr.; Fr. March.

12. V. EXARISTATUM, Kurz in Journ. As. Soc. Beng. 1873. 86.

HAB. Common in the drier hill-forests, especially the stunted ones, of Martaban, at 5000 to 6000 ft. elevation.—Fr. March.

Possibly only an exaristate form of *V. Leschenaultii*, Wight. *V. Malaccense*, one of this vicinity, differs in the puberulous corolla.

ERICACEÆ.

Conspectus of Genera.

Trib. 1. *ARBUTEÆ.* Corolla deciduous. Fruit a drupe or berry.

PERNETTYA. Corolla globular urn-shaped, the limb 5-toothed and reflexed. Stamens 10. Hypogynous scales 10, 3-lobed. Ovary 5-celled, the cells many-ovuled.

Trib. 2. *ERICEÆ.* Corolla deciduous or persistent. Fruit a capsule.

* *Capsule loculicidally 5—6-valved.* (Andromedeæ).

GAULTHERIA. Calyx 2-bracted at the base. Corolla urceolate, the revolute limb 5-cleft. Stamens 10; anthers 2-cleft, the cells terminating in 2 awns. Hypogynous scales 10, usually united at the base. Calyx fleshy or succulent in fruit.

ANDROMEDA. Corolla globular to tubular-urn-shaped, the reflexed limb 5-toothed. Stamens 10, included; anther-cells usually one-awned. Calyx open in bud, dry in fruit.

* * *Capsule dehiscing septicidally from the apex.* (Rhododendreae).

RHODODENDRON. Corolla funnel- or bell-shaped, 5-cleft. Stamens 5 or 10, declinate; anthers opening by terminal pores. Capsule 5-celled.

Gaultheria, L.

1. G. PUNCTATA, Bl. Bydr. 856; Miq. Fl. Ind. Bat. II. 1055.

Var. α. BLUMEI, leaves linear-oblong to oblong, very shortly petioled or almost sessile. A shrub, glabrous, the branchlets triquetrous.

? Var. β. FRAGRANTISSIMA, (*G. fragrantissima*, Wall. in Asiat. Res. XIII. 207. c. icon.; Wight Icon. t. 1196; Bot. Mag. t. 5984), leaves obovate to obovate oblong and oblong, longer (up to ⅜ in.) or shorter petioled. A small bushy tree or at high elevations reduced to a shrub of a few feet in height, the branchlets triquetrous.

? Var. γ. LESCHENAULTII, (*G. Leschenaultii*, DC. Prod. VII. 593; Wight Icon. t. 1195 and Illustr. t. 141. C.; *Andromeda Kathagerensis*, Hook. Icon. t. 246), branchlets more or less terete, covered with appressed blackish bristles; leaves often smaller, shortly petioled, the glands beneath often produced into appressed bristles. A shrub, large or often only ½ to a foot high.

HAB. Var. β. and γ. frequent in the drier hill-forests, especially the stunted ones, of the Martaban hills, at 6000 to 7000 ft. elevation.—Fl. Febr.; Fr. March.

The forms here brought together vary greatly in the length of the petiole, the pubescence of the corolla inside, size of plant, &c., and require further study.

Andromeda, L.

1. A. OVALIFOLIA, Wall. Cat. 763 and in Asiat. Res. XIII. 391 cum icon.; Clegh. in Journ. Agr. Hort. Soc. Beng. XIV. 260. cum tab.; Wight Icon. t. 1199. (*Pieris ovalifolia*, Don. Gen. Syst. III. 832; DC. Prod. VII. 599; *A. lanceolata*, Wight Icon. t. 1198?).

HAB. Frequent in the drier hill-forests, especially the stunted ones and in the pine-forests, of Martaban, at 5000 to 7000 ft. elevation.—Fr. March.

Rhododendron, L.

Conspectus of Species.

* *Leaves shortly appressed tomentose or lepidote beneath. Calyx inconspicuous.*

Leaves beneath silvery and shortly tomentose beneath; ovary rusty puberulous; bracts of leaf-buds villous, ... *R. arboreum.*

Leaves beneath and ovary and style rusty lepidote; bracts of leaf-buds silky ciliate only, ... *R. formosum.*

* * *Leaves glabrous and smooth.*

Ovary and style quite glabrous; bracts of leaf-buds ciliolate, ... *R. Moulmeinense.*

1. R. ARBOREUM, Sm. Exot. Fl. t. 6; Bot. Reg. t. 890, 1240 and 1982; DC. Prod. VII. 720; Hook. Exot. Fl. t. 168; Bot. Mag. t. 3290; Houtt. Fl. d. serr. IX. t. 945; Wight Icon. t. 1201; Bedd. Fl. Sylv. Madr. t. 228.

HAB. In the hill-forests of the Karenee country (Rev. F. Mason).

2. R. FORMOSUM, Wall. Pl. As. rar. III. 3. t. 207; DC. Prod. VII. 721; Bot. Mag. t. 4457.

Var. β. VEITCHIANUM, (*R. Veitchianum*, Hook. Bot. Mag. t. 4992), flowers nearly twice the size; leaves not ciliate.

HAB. Martaban, not unfrequent on the top of Nattoung, at 7200 ft. elevation.—var. β. Moulmein hills.—Fl. March.

3. R. MOULMEINENSE, Hook. Bot. Mag. t. 4904.

HAB. Common in the hill-forests, especially the damper ones, from Martaban down to Tenasserim, at 4000 to 7000 ft. elevation.—Fl. March.

Near allied to *R. Javanicum*, from which it differs in its perfectly glabrous style and ovary and somewhat different nervation (the lateral nerves arising almost rectangularly from the midrib).

EPACRIDEÆ.

Leucopogon, R. Br.

1. L. MALAYANUS, Jack in Mal. Misc. I. No. 2 and in Hook. Bot. Misc. II. 71; Wall. in Roxb. Fl. Ind. II. 301; DC. Prod. VII. 744.

Var. α. GENUINA, leaves larger and broader, 1½ to 2 in. long, acute and mucronate; spikes about ½ in. long.

Var. β. MOLUCCANUS, (*L. Moluccanus*, Scheff. Obs. phytog. 97). leaves ½ to an in. long, 1½ to 2½ lin. broad, subulate-pointed; spikes only 1½—2 lin. long.

HAB. Var. α. Burma, probably Tenasserim (Griff. 3153/1); var. β. Tenasserim (Helf. 3153).

PLUMBAGINEÆ.

Conspectus of Genera.

Trib. 1. *STATICEÆ.* Styles entirely, or at least at the summit free. Fruit an utricle bursting at the base or circumsciss at the top.

ÆGIALITIS. Styles glabrous, free; stigmas capitate. Petals coriaceous, jointed beyond the connate base; fruit elongate, exserted; albumen none. Treelets.

Trib. 2. *PLUMBAGEÆ.* Styles entirely connate. Pericarp more or less dehiscing into 2 valves.

PLUMBAGO. Calyx glandular-muricate. Fruit included in the calyx. Herbs.

Ægialitis, R. Br.

1. Æ. ANNULATA, R. Br. Prod. Nov. Holl. I. 426; DC. Prod. XII. 621. (*Æg. rotundifolia*, Roxb. Fl. Ind. II. 111; Griff. Not. Dicot. 207. t. 461. f. 2).

HAB. Frequent in the littoral forests all along the shores from Chittagong down to Tenasserim and the Andamans.—Fl. Fr. CS.

Plumbago, L.

Conspectus of Species.

Spikes glandular-pubescent; corolla white; bract ovate, leafy; bractlets subulate, ..*P. Zeylanica.*

Spikes glabrous or nearly so; corolla rose-coloured or scarlet; bract ovate-oblong, scarious, brown; bractlets conform with the bracts, ...*P. rosea.*

1. P. ZEYLANICA, L. sp. pl. 215; Roxb. Fl. Ind. I. 463; DC. Prod. XII. 692.

HAB. In rubbishy places in and around villages, along river-banks and in toungyas, not unfrequent all over Burma, but apparently nowhere really wild.—Fl. Fr. ∞.

2. P. ROSEA, L. sp. pl. I. 215 ; Roxb. Fl. Ind. I. 463 ; Bot. Mag. t. 230 and t. 5363.—(*P. coccinea*, Boiss. in DC. Prod. XII. 693).

HAB. Not unfrequent in the moister mixed forests of the Pegu Yomah and the Martaban hills down to Tenasserim ; also Ava. Often cultivated and springing up in toungyas, along the river-banks, etc.—Fl. Fr. CS.

PLANTAGINEÆ.

Plantago, L.

1. P. MAJOR, L. sp. pl. 163 ; Engl. Bot. t. 1558 ; Flor. Dan. t. 461 ; DC. Prod. XIII/1, 694.

Var. *β*. ASIATICA, Dcne. in DC. Prod. XIII/1, 694 (*P. Asiatica*, L. sp. pl. 163 ; Wight Illustr. t. 177).

HAB. Ava, Khakyen hills (J. Anderson).

Endlicher places *Plantagineæ* near *Plumbagineæ*, and I believe this to be the true affinity, for, with the exception of the stamens being alternate with the petals, the characters are all reducible to the Plumbaginaceous type.

PRIMULACEÆ.

Conspectus of Genera.

Trib. 1. *PRIMULEÆ.* Capsule quite free (not adnate to the base of the calyx), dehiscing usually by longitudinal valves.

PRIMULA. Corolla salver- or funnel-shaped, furnished at the throat with 5 gibbose swellings. Capsule opening by 5-valves. Scapigerous annuals or perennials.

LYSIMACHIA. Corolla rotate or bell-shaped, with gibbose swellings at the throat. Capsule usually 5-valved. Erect or creeping simple or branched herbs. Flowers solitary and axillary, or in racemes or spikes.

Trib. 2. *ANAGALLIDEÆ.* Capsule quite free, circumsciss-dehiscing.

ANAGALLIS. Corolla rotate or bell-shaped. Herbs with alternate or opposite leaves.

Lysimachia, L.

Conspectus of Species.

* *Flowers solitary or by pairs in the leaf-axils.*

Glabrous ; stem erect, terete ; leaves linear ; flowers slenderly pedicelled, .. *L. linearifolia.*

Glabrous, erect, the stem 4-cornered ; flowers slenderly pedicelled ; leaves lanceolate, .. *L. peduncularis.*

* * *Flowers in terminal racemes.*

× All parts glabrous.

Stamens shorter than the petals, narrowly bordered, ... *L. multiflora.*

Stamens exserted ; sepals broadly-white-bordered, ... *L. lobelioides.*

× × Stems and racemes (glandular ?) hairy.

Habit of *L. lobelioides*, corolla twice the length of the calyx, ... *L. Griffithiana.*

1. L. LINEARIFOLIA, Griff. in Journ. As. Soc. Beng. 1873. 86.

HAB. Burma, probably Ava (Griff. 3532).

2. L. PEDUNCULARIS, Wall. Cat 1489.

HAB. Ava, Taong-dong (Wall.); Tenasserim, Zwakabin (Rev. C. Parish).—Fl. Fr. Octob.

3. L. MULTIFLORA, Wall. Cat. 1487; DC. Prod. VIII. 63; Klatt, Gatt. Lysim. 14. t. 4.

HAB. Ava, near Bhamo (J. Anderson).—Fl. Febr.

4. L. LOBELIOIDES, Wall. in Roxb. Fl. Ind. II. 29; DC. Prod. VIII. 61; Bot. Reg. t. 6; Klatt, Gatt. Lysim. 16. t. 2.

HAB. Ava, Khakyen hills (J. Anderson).—Fl. May.

5. L. GRIFFITHIANA, Kurz in Journ. As. Soc. Beng. 1873. 86.

HAB. Ava, in fields towards Karmein.—Fl. April.

Apparently allied to the preceding species.

MYRSINEÆ.

Conspectus of Genera.

Subord. I. EU-MYRSINEÆ. Fruit an indehiscent berry or drupe. Seeds with albumen.

Trib. 1. *ARDISIEÆ.* Staminodes none. Anthers not transversely chambered. Ovary inferior to superior.

* *Ovary inferior or half-inferior. (Mæseæ).*

MÆSA. Corolla bell-shaped or nearly so, imbricate in bud. Calyx 2-bracted. Drupe crowned by the calyx-limb, globular. Erect shrubs or trees.

* * *Ovary superior. Drupes globular. (Ardisieæ).*

× Flowers pedicelled, clustered, lateral or axillary.

MYRSINE. Corolla gamo- or rarely poly-petalous, imbricate or valvate. Flowers often polygamously diœcious. Ovules few. Erect trees or shrubs.

× × Flowers in racemes or panicles.

SAMARA. Corolla of 5 or 4 free petals imbricate in bud. Anthers as long as or shorter than the filaments. Ovules few. Climbers.

ARDISIA. Corolla gamopetalous, usually rotate, twisted in bud. Anthers longer than the filaments, free. Ovules numerous. Trees, shrubs, or undershrubs.

Trib. 2. *TEOPHRASTEÆ.* Staminodes 5, alternating with the stamens. (American).

JACQUINIA. Corolla rotate-bellshaped, deeply 5-cleft. Berry few-seeded.

Subord. II. ÆGICEREÆ. Fruit a dry cylindrical follicle-like drupe rupturing irregularly. Seeds elongate, germinating while still on the tree. Albumen none. Anther-cells many-chambered.

ÆGICERAS. Corolla twisted in bud. Filaments connate at the base. Flowers in umbels. Trees.

Mæsa, Forsk.

Conspectus of Species.

* *All parts, also the inflorescence, quite glabrous.*

× Inflorescence very short (hardly as long as the petioles).

Branchlets verrucose; leaves minutely and remotely callus-toothed, ..*M. Andamanica.*

× × Inflorescence very much longer than the petioles.

† Leaves entire.

Racemes compound, shorter than the leaves, ... *M. ramentacea.*

† † Leaves coarsely serrate.

Racemes compound, shorter than the leaves; calyx only $\frac{1}{6}$ lin. long, ... *M. Indica.*

Racemes compound, very slender, as long as or longer than the leaves; calyx nearly a line long, ... *M. paniculata.*

* * *Inflorescence, and more or less also the sinuate-toothed leaves and softer parts, pubescent or otherwise hairy.*

Leaves softly pubescent, especially beneath; panicles or racemes dense, rusty pubescent, shorter than the petiole; bracts minute, ... *M. mollissima.*

Leaves glabrous, midrib beneath sparingly hairy; panicles densely rusty-hairy and mossy, much longer than the petioles; bracts about as long as the pedicels, .. *M. muscosa.*

1. M. ANDAMANICA, Kurz For. Fl. Burm. II. 575. (*M. verrucosa*, Kurz For. Fl. Burm. II. 98, non Scheff.).

HAB. In the tropical forests of South Andaman.—Fl. May, June.

2. M. RAMENTACEA, Roxb. Fl. Ind. I. 230; DC. Prod. VIII. 77; Miq. Fl. Ind. Bat. II. 1006; Scheff. Comment. Myrsin. 15. (*M. glabra*, Roxb. Fl. Ind. I. 560; *M. Sumatrana*, Scheff. l. c.).

HAB. Common in the tropical and moister mixed forests, all over Burma, from Chittagong and Ava down to Tenasserim and the Andamans, up to 2000 ft. elevation; freely springing up in deserted toungyas.—Fl. Jan.; Fr. March, April.

3. M. INDICA, DC. in Linn. Trans. XVII. 134; DC. Prod. VIII. 80; Miq. Fl. Ind. Bat. II. 1008. (*Bæobotrys Indica*, Roxb. Fl. Ind. I. 557; Wight Icon. t. 1206).

HAB. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and more so in those from Martaban down to Tenasserim up to 3000 ft. elevation; Chittagong; Ava, Khakyen hills.—Fl. March.

4. M. PANICULATA, A. DC. in Linn. Trans XVII. 133 and Prod. VIII. 78. (*M. montana β. elongata*, DC. Prod. VIII. 79 ?).

HAB. Tenasserim (Helf. 3559); Tavoy (Wall.).—Fl. Dec.

5. M. MOLLISSIMA, A. DC. Prod. VIII. 81. (*M. mollis*, A. DC. l. c. 82; *M. permollis*, Kurz in Journ. As. Soc. Beng. 1871. 66, forma latifolia).

HAB. Rather frequent in the tropical forests of the eastern slopes of the Pegu Yomah and more so from Martaban down to Upper Tenasserim, Thoungyeen (Brandis); Ava, Khakyen hills.—Fl. March, April.

6. M. MUSCOSA, Kurz in Journ. As. Soc. Beng. 1873. 87.

HAB. Burma, probably Ava (Griff. 3556).

Myrsine, L.

Conspectus of Species.

* *Stigma 2—3-lobed, usually fringed.*

× Style longer or shorter. Leaves more or less serrate, especially towards the apex.

Pedicels slender and stiff, 3—5 lin. long, ... *M. Khasyana.*

Pedicels thick, 1—2½ lin. long, ... *M. semiserrata.*

× × Stigmas almost sessile. Leaves entire.

Leaves exactly those of *M. capitellata;* pedicels thick, shorter than the flower or drupe; stigmas small, ... *M. avenis.*

* * *Stigma simple, linear and usually thick. Leaves entire.*

Flowers almost sessile or shortly pedicelled, densely clustered; lateral nerves thin but usually distinct, ... *M. capitellata.*

1. M. SEMISERRATA, Wall. in Roxb. Fl. Ind. II. 294 (1824) and Flor. Nep. Tent. 34. t. 24; DC. Prod. VIII. 93. (*M. subspinosa,* Don Prod. Nep. 147 (1825 ?); DC. Prod. VIII. 94 ?).

HAB. Not unfrequent in the hill-forests of Martaban east of Tounghoo, above 6000 ft. elevation.—Fl. Fr. March.

I am not sure about the plant which Wallich figures in his Tent. Nepal; but as all the specimens of Wallich's Herbarium seen by me belong to the short-pedicelled form, I have followed DC. and others in regarding them the same. But there is a form common in the Khasi hills (apparently restricted to this locality) which has very slender, long, and stiff pedicels and this I am inclined to treat as a distinct species (*M. Khasyana*).

2. M. AVENIS, DC. in Linn. Trans. XVII. 108. and Prod. VIII. 96; Scheff. Comm. Myrs. 47. (*Ardisia avenis,* Bl. Bydr. 691).

HAB. Not unfrequent in the drier hill-forests of Martaban east of Tounghoo, at 4000 to 7000 ft. elevation.—Fl. March.

I am not sure whether the Burmese tree is Blume's species, which I have not seen. Scheffer's *M. avenis,* from Banca, is hardly the same as Blume's.

3. M. CAPITELLATA, Wall. in Roxb. Fl. Ind. II. 295 and Tent. Fl. Nepal. 35. t. 24; Bot. Mag. t. 3222; Wight Icon. t. 1211; DC. Prod. VIII. 95; Bedd. Fl. Sylv. t. 234. *M. lucida,* Wall. Cat. 2298; DC. Prod. VIII. 95.

HAB. Not unfrequent in the eng-forests of the Prome District; Ava, Taong-dong (Wall.); Martaban, Nattoung hills (Rev. Mason).

Of this species there are two forms, or more likely two distinct species,—the genuine one, represented also in Burma, which has clustered sessile or almost sessile flowers, and the nerves of which are thin but pretty distinct,—and the pedicellate form, the flowers of which rest on short thick pedicels, and this also has the lateral nerves very obsolete.

Samara, L. (1767).

(*Embelia,* Burm. 1768.)

Conspectus of Species.

* *Inflorescence terminal, or terminal and axillary. Filaments short and thick.*

× Leaves softly pubescent.

Inflorescence brown puberulous; pedicels capillary, ... *S. microcalyx.*

× × Leaves glabrous.

Branchlets and inflorescence greyish or tawny velvety or puberulous; pedicels terete, .. *S. Ribes.*

As preceding, but the velvety pubescence always greyish; flowers sessile, *S. sessiliflora.*

All parts, also the inflorescence, quite glabrous; pedicels 4-cornered, ... *S. floribunda.*

* * *Inflorescences axillary only. Filaments longer than the anthers, slender and filiform. Young shoots more or less pubescent.*

× Leaves beneath more or less pubescent (at least the nerves). Flowers 5-merous.

† Leaves on long petioles.

Leaves 3—5 in. long; racemes elongate; pedicels short, ... *S. robusta.*

Leaves 2—2½ in. long; racemes short; pedicels very long and slender, ... *S. vestita.*

† † Leaves almost sessile.

Leaves ⅕—1 in. long, distichous, not pellucid-dotted, only the midrib puberulous; racemes very short and almost umbel-like, ... *S. parviflora.*

× × Leaves quite glabrous. Flowers 4-merous.

Leaves ½—1 in. long, serrately 3-toothed at the apex, conspicuously gland-dotted beneath; racemes very short and almost umbel-like, ... *S. Myrtillus.*

1. S. RIBES, Bth. and Hf. (*Embelia Ribes*, Burm. Fl. Ind. 62. t. 23; DC. Prod. VIII. 85; Roxb. Fl. Ind. I. 586; Scheff. Comm. Myrs. 38; *Embeliæ* sp. Griff. Not. Dicot. 293 ?).

Var. α. GENUINA, leaves destitute of hollow glands; flowers racemose, in panicles.

Var. β. GLANDULIFERA, (*Embelia glandulifera*, Wight Icon. t. 1207; Walp. Ann. I. 494), leaves with many or only few hollow glands along or near the midrib; flowers often in simple axillary racemes, only those at the ends of the branchlets panicled.

HAB. Var. α. frequent in the tropical forests of Martaban and Tenasserim; also Chittagong.—Fr. March.

2. S. SESSILIFLORA, (*Embelia sessiliflora*, Kurz in Journ. As. Soc. Beng. 1871. 66).

HAB. Burma, probably Karen hills.

Probably only a sessile-flowered variety of the preceding species.

3. S. FLORIBUNDA, Bth. and Hf. (*Embelia floribunda*, Wall. in Roxb. Fl. Ind. II. 291; DC. Prod. VIII. 85; *Embelia garciniæfolia*, Miq. Pl. Jungh. 187; Scheff. Comm. Myrs. 40).

HAB. Not unfrequent in the stunted hill-forests of the Nattoung, Martaban, at 6000—7200 ft. elevation.—Fl. March.

4. S. ROBUSTA, Bth. and Hf. (*Embelia robusta*, Roxb. Fl. Ind. I. 587; DC. Prod. VIII. 86; *Embelia picta*, DC. l. c.).

Var. α. ROXBURGHII, Kurz For. Fl. Burm. II. 103.

Var. β. VILLOSA, Kurz l. c. (*Embelia villosa*, Wall. in Roxb. Fl. Ind. II. 289; DC. Prod. VIII. 85; *Embelia ferruginea*, Wall. ap. DC. Prod. l. c. 86).

Hab. Only var. β. but this form common in the upper mixed forests, all over the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Aug., Sept.; Fr. Jan., Febr.

The extreme forms of *Embelia robusta*, and *E. villosa*, look very different, but they offer no characters for a safe distinction. The length of the pedicels and of the bracts and the thickness of the rachis of the racemes vary as much as the indumentum. The striæ on the drupes of *E. robusta* are not always present.

5. S. vestita, Bth. and Hf. (*Embelia vestita*, Roxb. Fl. Ind. ed. Wall. II. 288; DC. Prod. VIII. 88; *Embelia nutans*, Wall. l. c. 290).

Hab. Rather rare in the tropical forests, especially along choungs, of the Pegu Yomah.

6. S. parviflora, (*Embelia parviflora*, Wall. Cat. 2307; DC. Prod. VIII. 86; Scheff. Comm. Myrs. 44).

Hab. Ava (Griff. 3545); Khakyen hills (J. Anderson).—Fl. March.

7. S. Myrtillus, (*Myrsine Myrtillus*, Hook. Icon. t. 825; Walp. Ann. V. 473; *Embelia Myrtillus*, Kurz in Journ. As. Soc. Beng. 1871. 67).

Hab. Burma (Griff. 3542).

Ardisia, Sw.

Conspectus of Species.

* *Panicles irregularly branched and compound, terminal, or accompanied by smaller ones in the axils of the upper leaves.*

+ Pedicels much shorter than the calyx, or the flowers almost sessile.

Leaves entire; panicle stiff and stout, rusty puberulous; calyx-lobes acute, .. *A. rigida.*

× × Pedicels much longer than the calyx.

† Leaves entire.

Leaves coriaceous, decurrent on the strong petiole, the nerves arising at an acute angle; panicle glabrous or nearly so, ample; peduncle angular, ... *A. paniculata.*

Leaves almost chartaceous, not decurrent, the nerves diverging almost rectangularly, numerous; panicle slightly puberulous; peduncle compressed, ... *A. anceps.*

Leaves chartaceous; panicles rusty-puberulous, chiefly from the axils of the upper leaves; calyx-lobes lanceolate, ... *A. neriifolia.*

† † Leaves serrulate.

Habit of the preceding; calyx-lobes linear, ... *A. serrulata.*

* * *Flowers in racemes often contracted umbel-like, rarely the racemes or umbels simply compound, axillary, lateral or axillary and terminal.*

× Umbels in small axillary corymbs or cymes. (*Pimelandra*, DC.)

Nearly glabrous; leaves thin coriaceous; flowers minute; cymes rusty velvety, of the length of the petiole, ... *A. eugeniæfolia.*

× × Umbels or racemes simple or compound.

† Umbels forming a simple terminal panicle.

Very like *A. attenuata*, but umbels panicled; leaves much dotted; pedicels ½—1 in. long, ... *A. Andamanica.*

† † Umbels or racemes simple, very rarely slightly compound, axillary or lateral, rarely spuriously terminal, *i. e.* arising laterally from the summit of an axillary shoot.

O Leaves entire.

‡ Calyx-lobes acute or acuminate, lanceolate or narrow.

Racemes almost terminal, umbel-like, puberulous, ... *A. grandifolia.*

‡ ‡ Calyx-lobes broad, rounded or blunt.

△ Young shoots, and often also the inflorescence or under surface of leaves, puberulous or pilose.

Pedicels 8—10 lin. long, recurved; calyx-lobes a line long, ... *A. Amherstiana.*

△ △ Quite glabrous.

Pedicels ½ in. long; leaves 5—10 in. long, obovate-lanceolate, ... *A. polycephala.*

Pedicels about an inch long.

Leaves 3—5 in. long; corolla-lobes nearly 2½ lin. long, ... *A. oblonga.*

Leaves 3—5 in. long, obovate-lanceolate, the lateral nerves rather distant, thin but strong, irregular, ... *A. humilis.*

Very similar to the above but the leaves more coriaceous, the lateral nerves rather crowded, straight, thin and often obsolete, ... *A. littoralis.*

O O Leaves more or less serrate or crenate (at least towards the apex).

‡ Inflorescence peduncled, simple.

△ Calyx-lobes bluntish.

Glabrous or the young shoots and slender-bracted racemes puberulous; leaves acute, .. *A. Wallichii.*

Glabrous; leaves blunt; racemes umbel-like, puberulous or glabrous, somewhat shorter than the leaves, ... *A. Brandisiana.*

△ △ Calyx-lobes acute.

Rusty tomentose or pubescent; leaves acuminate, ... *A. Helferiana.*

‡ ‡ Racemes peduncled, simply compound.

Habit of *A. crispa*, but leaves larger and green, callous-repand-toothed, conspicuously gland-dotted beneath; pedicels up to ½ in. long; berries the size of a pea, striate, .. *A. membranacea.*

Very similar to the above, but racemes divaricately corymbose and spuriously terminal; pedicels up to 2 in. .... *A. virens.*

‡ ‡ ‡ Inflorescence umbellate, sessile, or at least the primary racemes sessile and the lateral ones peduncled.

Umbels sessile, like the leaves glabrous; calyx-lobes a line long, ... *A. crispa.*

Leaves beneath and the sessile umbels brownish or rusty tomentose; calyx-lobes 2½ lin. long, ... *A. villosa.*

1. A. RIGIDA, Kurz in Journ. As. Soc. Beng. 1873. 87.

HAB. Tenasserim (or Andamans) (Helf. 3563).

N. B. *Ardisia chrysophylloides*, Miq. = *A. tuberculata*, Wall.

2. A. PANICULATA, Roxb. Fl. Ind. I. 580; DC. Prod. VIII. 126; Bot. Reg. t. 638; Bot. Mag. t. 2364.

HAB. Hilly parts of Chittagong (Roxb.).

3. A. ANCEPS, Wall. in Roxb. Fl. Ind. II. 280; DC. Prod. VIII.

127. (*A. Blumei*, DC. in Linn. Trans. XVII. 117 and Prod. VIII. 128, *teste* Scheffer).

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim, up to 3000 ft. elevation.—Fr. Febr.—May.

Scheffer attributes black berries to the Blumean species, while the Roxburghian has them white when fully ripe.

4. A. NERIIFOLIA, Wall. ap. DC. Prod. VIII. 127.

HAB. Burmah (Griff. 3581), probably Ava hills.

5. A. SERRULATA, Kurz in Journ. As. Soc. Beng. 1873. 87.

HAB. Burmah (Griff. 3562), probably Ava hills.

6. A. EUGENIÆFOLIA, Wall. Cat. 2276; DC. in Linn. Trans. XVII. 120 and Prod. VIII. 130.

HAB. Burmah (Griff. 3598, with smaller flowers); Martaban, Taipo Mountains, at 4000 ft. elevation.—Fl. Febr.

7. A. ANDAMANICA, Kurz For. Fl. Burm. II. 108.

HAB. Not unfrequent in the tropical forests of the Andaman islands. —Fl. June.

So very near to *A. oblonga*, DC., that the inflorescence only distinguishes it.

8. A. GRANDIFOLIA, DC. in Linn. Trans. XVII. 122 and Prod. VIII. 132.

HAB. Tenasserim, Tavoy.

Unknown to me.

9. A. AMHERSTIANA, DC. in Linn. Trans. XVII. 120 and Prod. VIII. 131.

HAB. Pegu, near Rangoon (Cleghorn); Tenasserim, apparently frequent around Moulmein (Wall., Falconer).—Fl. March; Fr. Febr., March.

N. B. *A. reflexa*, Wall. Cat. 2282. p. p.; DC. in Linn. Trans. XVII. 122, and Prod. VIII. 132, is a species unknown to me and comes from Tenasserim. The description does not point out differences from the preceding species.

10. A. POLYCEPHALA, Wall. Cat. 2293; DC. in Linn. Trans. XVII. 118 and Prod. VIII. 131.

Var. *β*. ACUMINATA, leaves acuminate, the nerves strong and anastomosizing within the margin of the leaves. Probably a distinct species.

HAB. Tenasserim, Salween river above Murgyee, near the large mount (Wall.; Helf.); var. *β*. frequent in the tropical forests all along the eastern slopes of the Pegu Yomah and in those of Martaban.—Fl. Fr. March—May.

N. B. *A. arborescens* (Wall. Cat. 2289; DC. in Linn. Trans. XVII. 120 and Prod. VIII. 131, from Taong-dong, Ava), is unknown to me.

11. A. OBLONGA, A. DC. in Linn. Trans. XVII. 121 and Prod. VIII. 131.

HAB. Not unfrequent in the tropical forests of Martaban and Tenasserim; also Andamans.—Fl. June; Fr. Sept.—March.

N. B. *A. attenuata*, Wall. Cat. 2286 p. p.; DC. in Linn. Trans. XVII. 119 and Prod. VIII. 131 from Tavoy, is unknown to me but apparently not different from the above.

12. A. HUMILIS, Vahl Symb. Bot. III. 40 (1794); DC. Prod. VIII. 129; Wight Icon. t. 1212.—(*A. solanacea*, Roxb. Corom. Pl. I. 27. t. 27 and Fl. Ind. I. 580; Bot. Mag. t. 1677; *A. elliptica*, Thbg. Nov. gen. pt. 8. (1795)?)

HAB. Frequent in the tropical forests of the Pegu Yomah, Arracan and Martaban.—Fl. March—April; Fr. Octob.

13. A. LITTORALIS, Andr. Repos. X. t. 630 (1804).—(*A. obovata*, Bl. Bydr. 688; DC. Prod. VIII. 132; *A. umbellata*, Roxb. Fl. Ind. I. 582 (ed. prior II. 273); *Climacandra obovata*, Miq. Pl. Jungh. I. 199 and Fl. Ind. Bat. II. 1030; Scheff. Comm. Myrs. 95; *Climacandra umbellata*, Miq. l. c.; *Climacandra littoralis*, Kurz in Journ. As. Soc. Beng. 1871. 68).

HAB. In the beach-jungles and along the sea-coasts of Tenasserim and the Andamans.—Fl. May, June.

14. A. WALLICHII, DC. in Linn. Trans. XVII. 123 and Prod. 137.

Var. *α.* GENUINA, the young shoots and inflorescence covered with a rusty-brown floccose-pilose pubescence, the net-venation more copious and more prominent, the dots more conspicuous.

Var. *β.* GLABRIUSCULA, young shoots glabrous; inflorescence and pedicels indistinctly puberulous; net-venation almost obsolete.

HAB. Frequent all over Pegu and Martaban down to Tenasserim; var. *α.* in the low and eng-forests; var. *β.* chiefly in the mixed forests. Fl. Fr. Sept.—Jan., chiefly April, May.

15. A. BRANDISIANA, Kurz in Journ. As. Soc. Beng. 1871. 67.

HAB. Martaban, Salween, along a choung near Toumbjotseik, below 500 ft. elevation, (Dr. Brandis).—Fl. May.

16. A. HELFERIANA, Kurz in Journ. As. Soc. Beng. 1873. 86.

HAB. Tenasserim (Helf. 3589).

17. A. VIRENS, Kurz For. Fl. Burm. II. 575.

HAB. Ava, Khakyen hills (J. Anderson).

Leaves and inflorescence very like those of *Amblyanthus glandulosus.*

18. A. CRISPA, DC. in Linn. Trans. XVII. 127 and Prod. VIII. 134. (*Bladhia crispa*, Thbg. Fl. Jap. 97?; *A. crenulata*, Lodd. Bot. Cab. t. 2., non Vent.; *A. crenata*, Bot. Mag. t. 1950; Roxb. Fl. Ind. I. 583, in icone ined. flores flavescentes depicti; *A. lentiginosa*, Bot. Reg. t. 553; *A. densa*, Miq. Suppl. Fl. Sum. 575; *A. macrocarpa*, Wall. in Roxb. Fl.

Ind. II. 271; DC. Prod. VIII. 134; *A. polysticta*, Miq. Suppl. Fl. Sumatr. I. 576; Scheff. Comm. Myrs. 75, sepalis acutis).

HAB. Not unfrequent in the damp hill-forests of the Martaban hills, at 4000—7000 ft. elevation; Burmah, probably Ava (Griff. 3583/1).—Fl.—Fr. March.

Thunberg's species has not only a different nervature but is characterised also by the numerous conspicuous gland-dots. Khasi specimens (Hb. Hf. and Th. No. 41), however seem identical with the Japan plant.

19. A. VILLOSA, Roxb. Fl. Ind. I. 582; DC. Prod. VIII. 136.—(*A. mollis*, Bl. Bydr. 689; *A. villosa, β. mollis*, DC. l. c.; Scheff. Comm. Myrs. 90; *A. vestita*, Wall. in Roxb. Fl. Ind. II. 274; DC. l. c.)

Var. *α*. ROXBURGHIANA, leaves more or less rusty pubescent, at least on the nerves.

Var. *β*. GLABRATA, (*A. glabrata*, Bl. Bydr. 692; DC. Prod. VIII. 136), leaves glabrous at least when full-grown; calyx glabrous or nearly so.

HAB. Var. *α*. only, Martaban, Taipo mountain, at 4000 ft. elevation (Dr. Brandis); Tenasserim, Tavoy (Wall.).—Fl. Sept., Octob.; Fr. Oct.—Febr.

Ægiceras, Gærtn.

1. Æ. CORNICULATA, Blanco Fl. Filip. 79. (*Rhizophora corniculata*, L. sp. pl. 635; Rheed. Hort. Malab. VI. t. 36; *Æ. majus*, Gærtn. Fruct. I. 216. t. 46. f. 1; DC. Prod. VIII. 142; Roxb. Fl. Ind. III. 130; Scheff. Comm. Myrs. 97; *Æ. minus*, Gærtn.; DC. l. c.; *Æ. fragrans*, Kœn. Ann. Bot. I. 129; Hook. Bot. Misc. III. 84. t. 21; Griff. Not. Dicot. 294. t. 548. f. a.).

HAB. Frequent in the mangrove and tidal forests all along the coasts, from Chittagong down to Tenasserim and the Andamans.—Fl. Febr., March.

SAPOTACEÆ.

Conspectus of Genera.

Trib. 1. *Isomeri.* Calyx-lobes equal in number to the corolla-lobes.

* *Calyx-segments uniseriate.*

× Staminodes entirely absent.

CHRYSOPHYLLUM. Flowers 5-, rarely 6—7-merous, with as many ovary-cells and stamens.

× × Staminodes as many as stamens and usually alternating with them.

SIDEROXYLON. Flowers 5-merous. Ovary-cells 5—2. Stamens 5. Seeds albuminous.

SARCOSPERMA. Flowers 5-merous. Stamens and ovary-cells 5 each. Seeds without albumen. Stipules caducous.

* * *Calyx-segments in 2 distinct series.*

× Stamens as many as petals and alternating with as many staminodes

ACHRAS. Flowers 6-merous. Stamens 6. Ovary-cells 12.

× × Stamens twice as many as petals, or numerous. Staminodes none.

ISONANDRA. Flowers 4-merous. Stamens 8. Seeds with albumen. Ovary-cells 4.

DICHOPSIS. Flowers 6-merous. Stamens 12. Albumen none. Ovary-cells 6.

Trib. 2. *Anisomeri.* Corolla-lobes usually 2—3 times as many as calyx-lobes.

* *Staminodes none.*

× Ovary-cells twice as many as calyx-segments.

HEXAMERIA. Calyx-lobes 6. Corolla-lobes and stamens each 12. Ovary-cells 12.

PAYENA. Calyx-lobes 4. Corolla-lobes, stamens, and ovary-cells 8 each.

× × Ovary-cells as many as calyx-segments.

BASSIA. Calyx-lobes and ovary-cells 4 or 6; corolla-lobes 8—14. Stamens about 2 or 3 times as many as corolla-lobes, in 1—3 series.

* * *Staminodes* 6 *or* 8.

MIMUSOPS. Calyx-lobes and ovary-cells 6 or 8 each; corolla-lobes 2 or 3 times as many.

Chrysophyllum, L.

1. CH. ROXBURGHII, G. Don in Mill. Dict. IV. 33; Bedd. Sylv. Madr. t. 236. (*Ch. acuminatum*, Roxb. Fl. Ind. I. 599, non Lamk.; *Ch. Sumatranum*, Miq. Suppl. Fl. Sumatr. 579.)

HAB. Rather rare in the tropical forests above Rangoon, Pegu.—Fl. June; Fr. Dec.

Sideroxylon, L.

Conspectus of Species.

Subg. 1. *Oligotheca*, DC. Calyx-lobes acuminate or acute. Young shoots and under-surface of leaves more or less villous-tomentose.

Armed with long solitary supra-axillary spines; calyx-lobes acute, ... *S. armatum.*

Unarmed; calyx-lobes acuminate, ... *S. tomentosum.*

Subg. 2. *Eu-Sideroxylon.* Calyx-lobes rounded or blunt.

* *Berries* 1—2-*seeded.*

Younger parts coppery or rusty-silk hairy; leaves coriaceous, ... *S. attenuatum.*

* * *Berries several* (5—10)-*seeded.*

Glabrous; leaves chartaceous, ... *S. grandifolium.*

1. S. TOMENTOSUM, Roxb. Corom. Pl. I. 28. t. 28 and Fl. Ind. I. 602. (*Sapota? tomentosa*, DC. Prod. VIII. 175).

Var. *β.* SPINESCENS, the younger branchlets armed with short sharp spines in the leaf-axils.

HAB. Not unfrequent in the eng and dry forests of Prome; var. *β.* Pegu, more probably Prome (Dr. Brandis).

I have only leaf-specimens, and the identification is, therefore, somewhat doubtful.

2. S.? PARVIFOLIUM, Kurz For. Fl. Burm. II. 576 (*Mimusops parvifolia*, Kurz For. Fl. Burm. II. 123, excl. flor.)

HAB. Rather rare in the eng-forests of Prome; Ava, below Yenangchoung (Wall. Cat. 4146 G.).

Very like *S. elengoides*. It is rather a small tree, spiny armed, but Wallich's incomplete specimen (although doubtless identical) is unarmed. The flowers (loose) attached to Wallich's specimen resemble those of *Mimusops littoralis*, and I now entertain little doubt that they do not belong at all to the leaf-specimens.

3. S. ATTENUATUM, DC. Prod. VIII. 178; Wight Icon. t. 1590; Miq. Fl. Ind. Bat. II. 1037.

HAB. Tropical forests of Tenasserim, from Moulmein (Falconer) down to Mergui (Helfer, Griff., etc.); also Andamans, Narcondam island.—Fl. March.

4. S. GRANDIFOLIUM, Wall. in Roxb. Fl. Ind. II. 349; DC. Prod. VIII. 178.—(*S. regium*, Wall. Cat. 4156).

HAB. Martaban, hill-ranges between the Beeling and Sittang (Dr. Brandis); Pegu (Wall.); tropical forests of the Andamans.—Fl. April; Fr. Febr., March.

The seeds of this species are albuminous.

Sarcosperma, Hf.

1. S. ARBOREUM, Hf. in Bth. Gen. Pl. II. 655. (*Sideroxylon arboreum*, Ham.; *Sapotea*, Griff. Not. Dicot. 291. t. 501).

HAB. Upper Burma, Namyoon (Griff.).

Achras, L.

*1. A. SAPOTA, L. sp. pl. 470; Jacq. Amer. 57. t. 41; Bot. Mag. t. 3111—12; Roxb. Fl. Ind. II. 181.—(*Sapota Achras*, Mill. Dict. No. 1.; DC. Prod. VIII. 174; Miq. Fl. Ind. Bat. II. 1036).

HAB. Of American origin, now frequently planted along roads at Rangoon and other larger stations.—Fl. RS.

Isonandra, Wight.

Conspectus of Species.

Subg. 1. *Eu-Isonandra.* Flowers 4-merous. Seeds albuminous.

Subg. 2. *Apobassia,* DC. Flowers 4- or 6-merous. Seeds without albumen.

* *Flowers 4-merous.*

Leaves chartaceous, strongly nerved, ... *I. caloneura.*

* * *Calyx 6-parted, the 3 outer segments valvate* (Dichopsis, Thw.).

Leaves coriaceous, glaucous beneath, the nerves obsolete; filaments as long as the anthers, densely villous, ... *I. polyantha.*

Leaves coriaceous, glaucous beneath, the nerves strong and parallel; filaments long and slender, ... *I. obovata.*

1. I. CALONEURA, Kurz in Journ. As. Soc. Beng. 1871. 69 and 1873. 88 (*calophylla*).—(*Bassia caloneura*, Kurz in Andam. Rep. 41).

HAB. Not unfrequent in the tropical forests of the Andamans.—Fr. May.

Dichopsis and *Isonandra* differ in the number of floral parts and in the absence or presence of a rather scanty albumen. This species, however, has 4-merous flowers and no albumen, and hence I fear that the character derived from the albumen is of the same value as in *Linociera*, etc., amongst *Oleaceae*.

2. I. POLYANTHA. (*Bassia polyantha*, Wall. Cat. 4166; DC. Prod. VIII. 198; *Dichopsis polyantha*, Bth. and Hf. Gen. pl. II. 658).

HAB. Tropical forests of Boronga-island, near Akyab, Arracan, at 500—1000 ft. elevation.

There is another *Isonandra* in HBC. in leaf only, from Martaban, Mittigate (Falconer), with large chartaceous strongly parallel-nerved leaves glaucous beneath. It seems very near allied to the above.

3. I. OBOVATA, Griff. Not. Dicot. 293. (*Bassia ? hypoleuca*, Miq. Suppl. Fl. Sumatr. 582).

HAB. Tenasserim (Griff., Helfer); Moulmein (Falconer).—Fr. March.

Payena, A. DC.

Conspectus of Species.

Subg. 1. *HEXAMERIA*, Griff. Calyx 6-parted.

Filaments very short, villous; anthers glabrous, mucronate-acuminate, ... *P. Griffithii.*

Subg. 2. *EU-PAYENA.* Calyx 4-parted.

* *Anthers pilose* (Ceratophorus, Hassk.).

* * *Anthers glabrous.*

Connective of anthers produced into a broad blunt beak; sepals blunt or nearly so; nerves somewhat irregular; petiole about $\frac{1}{4}$—$\frac{1}{2}$ in. long, ... *P. lucida.*

Connective terminating in a bristle; sepals acute; nerves thin, parallel; petiole about an in. long, slender, ... *P. paralleloneura.*

1. P. LUCIDA, DC. Prod. VIII. 197; Miq. Fl. Ind. Bat. I. 1039.—(*Ceratophorus Wightii*, Hassk. Retz. I. 601; Miq. Fl. Ind. Bat. I. 1039; *Isonandra polyandra*, Wight Icon. t. 1589).

HAB. Burma (rather Malacca ?) (Griff. 3605).

2. P. PARALLELONEURA, Kurz in Journ. As. Soc. Beng. 1871. 70.

HAB. Frequent in the tropical forests of Martaban down to Tenasserim (Helf. 3611).—Fl. March; Fr. April, May.

Bassia, Kœn.

(*Dasyaulus*, Thw.; *Kakosmanthos*, Hassk.).

Conspectus of Species.

* *Anthers aristate, included, on very short filaments or almost sessile.*

Corolla-lobes very short (about $\frac{1}{3}$ as long as the tube); anthers in 3 rows; berries obovate-oblong, ... *B. latifolia.*

Corolla-lobes as long as the tube; anthers in 2 rows; berries unknown, ... *B. villosa.*

* * *Anthers blunt, on long slender filaments and exserted.*

Corolla-lobes as long as the tube; anthers in a single row inserted at the throat; berries ovate, acuminate, ... *B. butyracea.*

1. B. villosa, Wall. Cat. 4165; DC. Prod. VIII. 198.

Hab. Ava, Taong-dong (Wall.).—Fl. Nov.

Mimusops, L.

Conspectus of Species.

Leaves rounded or retuse; flowers solitary, rather small; anthers blunt (?); berries the size and shape of a wood-apple, 5—6-seeded, ... *M. littoralis.*

Leaves bluntish acuminate or apiculate; flowers clustered, conspicuous; anthers very acuminate; berries oval, usually 1-seeded, ... *M. Elengi.*

1. M. littoralis, Kurz in Journ. As. Soc. Beng. 1876. 138. (*M. Indica*, Kurz Andam. Rep. 42 and in Journ. As. Soc. 1871. 70).

Hab. Frequent in the coast-forests of the Andamans; also Tenasserim, Moulmein (Wallich, Theobald) and further south (Griff. 3613).—Fl. June, July; Fr. CS.

2. M. Elengi, L. sp. pl. 497; DC. Prod. VIII. 202; Roxb. Corom. Pl. I. 15. t. 14. and Fl. Ind. II. 236; Miq. Fl. Ind. Bat. II. 1042; Wight Icon. t. 1586; Bedd. Sylv. Madr. t. 40).

Hab. Not unfrequent in the tropical forests of South Andaman, also in those of Martaban and Tenasserim; generally planted in villages all over Burmah.—Fl. Febr.—Sept.

EBENACEÆ.

Conspectus of Genera.

* *Ovary-cells with 2 ovules.*

Maba. Calyx- and corolla-lobes usually trimerous. Ovary-cells usually as many as corolla-lobes.

Cargilia. Calyx and corolla 4—6-merous. Ovary-cells usually twice as many as corolla-lobes.

* * *Ovary-cells 1-ovuled.*

× Anthers opening by longitudinal slits.

Gunisanthus. Calyx- and corolla-lobes usually 4, rarely 6. Ovary-cells usually as many. Male and female flowers all solitary. Calyx of males divided to the base, the lobes narrow, membranous.

Diospyros. Calyx- and corolla-lobes usually 4—6. Male flowers clustered or cymose, the females solitary, or rarely in cymes or panicles. Calyx of males gamosepalous.

× × Anthers opening laterally by apical pores.

Leucoxylon. Characters of *Diospyros.*

Maba, Forst.

Conspectus of Species.

* *Ovary 6-celled, the cells 1-ovuled.*

Glabrous or nearly so; ovary glabrous, ... *M. Merguiensis.*

* * *Ovary 3-celled, densely pubescent.*

Leaves small, glabrous ; berries globular, the size of a pea, ... *M. buxifolia.*
Leaves large, hirsute along the nerves beneath ; berries oblong, more than an inch long, .. *M. Andamanica.*

1. M. MERGUIENSIS, Hiern Monog. Ebenac. 134.

HAB. Tenasserim, Mergui Archipelago (Helf. and Griff. 3618).—Fl. Jan. ; Fr. Febr.

I separate the species with 1-ovulate and 2-ovulate ovary-cells, and from this point of view the above species, which has 1-ovulate ovary-cells apparently twice as numerous as the floral parts, cannot be a true *Maba*, but may be referable to *Diospyros*. I have seen no specimens of it.

2. M. BUXIFOLIA, Pers. Ench. II. 606 ; DC. Prod. VIII. 240 ; Miq. Fl. Ind. Bat. II. 1050 ; Wight Icon. t. 763 ; Hiern Monog. Eben. 116 ; Bedd. Fl. Sylv. Madr. 148. t. 19. f. 4. (*Ferreola buxifolia*, Roxb. Corom. Pl. I. 35. t. 45. and Fl. Ind. III. 790 ; *M. Neilgherrensis*, Wight Illust. t. 148 bis ; *M. Ebenus*, Wight Icon. t. 1228—9).

HAB. Tenasserim, from Moulmein southwards (Griff., Wall., Falconer).—Fl. Febr., March.

3. M. ANDAMANICA, Kurz in Journ. As. Soc. Beng. 1876. 138. (*Macreightia Andamanica*, Kurz And. Rep. 42 ; Hiern Monogr. Ebenac. 124).

HAB. Frequent in the moister upper mixed forests of the Andamans. —Fl. RS. ; Fr. April.

Gunisanthus, DC.

Conspectus of Species.

Not flowering branchlets sparingly pubescent ; leaves glabrescent ; calyx-tube half the length of the corolla-lobes, ... *G. pilosulus.*
Not flowering branchlets densely villous ; leaves beneath permanently softly pubescent ; calyx-tube a little shorter than the corolla-lobes, ... *G. mollis.*

1. G. PILOSUS, DC. Prod. VIII. 220.—(*Diospyros pilosulus*, Wall. Cat. 4132 ; Hiern Monog. Eben. 188).

HAB. Not unfrequent in the tropical forests of the Andamans ; also in those of the Pegu Yomah.—Fl. April ; Fr. May, June.

2. G. MOLLIS, Kurz in Journ. As. Soc. Beng. 1873. 88.

HAB. Not unfrequent along choungs in the tropical forests of Martaban east of Tounghoo.—Fl. March.

Very near allied to the preceding species.

Diospyros. L.

Conspectus of Species.

Subg. 1. *AMUXIS*, Hiern. Calyx in bud globular and closed, the lobes connate but afterwards bursting irregularly into 2 or 3 lobes. Corolla tubular, 5-lobed. Ovary-cells as many as corolla-lobes.

Glabrous; leaves coriaceous and elegantly net-veined; corolla conspicuous, about 4 lin. long, very coriaceous, ... *D. Toposia.*

Subg. 2. *EU-DIOSPYROS*, DC. Calyx toothed or lobed, rarely truncate. Ovary-cells often twice as many as corolla-lobes.

* *Calyx in males short and truncate-toothed, in females large, deeply lobed; corolla urceolate, the lobes notched; anthers* 30—50.

Glabrous; leaves coriaceous, ... *D. Embryopteris.*

* * *Calyx toothed or lobed; corolla-lobes not notched; anthers about* 20 *or fewer.*

× Corolla urceolate, in bud globular or conical, the tube short and inflated, the lobes usually rounded and short.

+ Flower-buds globular; corolla quite glabrous; flowers small, hardly a line long.

Leaves thin chartaceous, with strong prominent nerves, the net-venation distinct, lax; ovary glabrous, ... *D. chartacea.*

Leaves thin-coriaceous, the nerves strong, the net-venation inconspicuous; ovary tawny villous, ... *D. ehretioides.*

+ + Flower-buds conical, acute, but never elongate.

† Ovary pubescent or villous. Leaves quite glabrous and glossy.

Flowers rather large, clustered, from the older branches, ... *D. ramiflora.*

Leaves glaucous-green when dry, almost polished, the nerves very inconspicuous and impressed; peduncles 4—5 lin. long; nearly 5—6 lin. long, axillary, .. *D. oleifolia.*

† † Ovary glabrous or nearly so.

‡ Leaves more or less rigid, quite glabrous, glossy.

Leaves drying blackish, the nerves and net-venation thin but prominent; flowers small axillary, the males cymose; berries globose, the size of a cherry; albumen homogeneous, ... *D. Kurzii.*

‡ ‡ Leaves membranous, at least while somewhat young more or less puberulous or pubescent.

O Berries sessile or nearly so.

Calyx-lobes of males acute; leaves more or less acuminate; berries the size of a cherry; albumen homogeneous, ... *D. mollis.*

Calyx-lobes blunt; leaves acute or apiculate; berries 2 or 3 times as large, ... *D. Kaki.*

O O Berry rather long-peduncled.

Leaves glaucescent, glabrescent; berries the size of a cherry; albumen homogeneous; spiny-armed tree, ... *D. montana.*

Leaves pubescent beneath; berries about an in. in diameter; albumen ruminate on the outer face; unarmed tree, peduncles shorter and stout, ... (*D. cordifolia ?*)

× × Corolla salver-shaped, elongately (very rarely shortly) conical, the tube not or hardly widened, the lobes as long or nearly as long as the tube.

+ Borders of the calyx-lobes of female flowers reflexed or revolute, at least at the base, and often appearing somewhat auricled.

† Corolla in bud short-conical. (*Otogyne*, DC.).

All younger parts tawny or greyish tomentose; leaves coriaceous, glabrescent above; flowers usually 5 (4—6)-merous; albumen ruminate, ... *D. Burmanica.*

Slightly appressed pubescent; leaves thin chartaceous; flowers 4-merous; calyx-lobes silky-pubescent, especially inside; ovary densely fulvous-tomentose, .. *D. rhodocalyx*

† † Corolla in bud elongate conical, 4-angular. Flowers 4-merous.

O Flowers (both sexes) forming tomentose bracted usually compound cymes. Berries globular.

Peduncles long, the cyme often compound; net-venation of leaves obsolete, *D. densiflora.*

Cymes large, corymb-like, fuliginous-velvety; net-venation strong but lax, *D. Horsfieldii.*

O O Flowers short-peduncled or sessile, axillary.

Flowers short-peduncled, clustered; net-venation indistinct; berries elliptical, ..*D. flavicans.*

Flowers sessile or nearly so; net-venation lax but distinct; berries globular, rusty-pubescent; albumen homogeneous, ...*D. undulata.*

As preceding, but ovary glabrous, ...*D. sapotoides.*

+ + Borders of the calyx-lobes in female flowers plain, not reflexed nor recurved.

† All parts, except the very young shoots, quite glabrous. Flowers almost sessile.

Flowers rusty-tomentose; calyx short, the lobes acute; leaves strongly net-veined; berries tawny-tomentose; corolla 4-cornered in bud, ...*D. lanceæfolia.*

Male calyx bell-shaped, the lobes short, rounded, tomentose; leaves strongly net-veined berries rusty-tomentose; corolla terete in bud, ...*D. pyrrhocarpa.*

Calyx ample, puberulous, the lobes rounded; male cymes very short and stout; leaves; strongly net-veined; corolla terete in bud, ...*D. variegata.*

† † All parts, especially the leaves, more or less pubescent or otherwise hairy; male flowers in cymes; berries glabrous.

Leaves not cordate, softly pubescent beneath; calyx-lobes and bracts acute; flowers 4-merous, ...*D. stricta.*

Leaves not cordate, adult almost glabrous and chartaceous; calyx-lobes linear-lanceolate; cymes branched, arising from the stem and older branches; flowers 5-merous, ..*D. Brandisiana.*

Leaves with cordate base, softly pubescent; calyx-lobes and bracts rounded; cymes short, stout; flowers 4-merous, ...*D. dasyphylla.*

1. D. Toposia, Ham. in Linn. Trans. XV. 115; Bedd. Icon. plant. t. 122; DC. Prod. VIII. 237; Hiern Monogr. Ebenac. 263.—(*D. racemosa*, Roxb. Fl. Ind. II. 536; DC. Prod. VIII. 239; Wight Icon. t. 416).

Hab. Chittagong.

2. D. Embryopteris, Pers. Ench. II. 624; Bot. Reg. VI. t. 499; DC. Prod. VIII. 235; Griff. Not. Dicot. 289; Hiern Monog. Eben. 257; Bedd. Sylv. Madr. t. 69. (*Embryopteris glutinifera*, Roxb. Corom. Pl. I. 49. t. 70; Wight Icon. t. 843—44; *D. glutinosa*, Koen. ap. Roxb. Fl. Ind. II. 533).

Hab. Martaban and Tenasserim, apparently not unfrequent; often cultivated in villages.—Fl. Aug.; Fr. Febr.—April.

3. D. chartacea, Wall. Cat. 4135; DC. Prod. VIII. 232; Hiern Monogr. Ebenac. 230.

Hab. Not uncommon in the tropical forests of Martaban and Upper-Tenasserim.—Fl. March, April.

4. D. ehretioides, Wall. Cat. 4137; DC. Prod. VIII. 231; Hiern Monogr. Eben. 162.

HAB. Frequent in all leaf-shedding, especially the mixed forests, all over Burmah, from Ava and Martaban down to Pegu, up to 3000 ft. elevation.—Fl. April, May; Fr. Decb., Jan.

5. D. RAMIFLORA, Roxb. Fl. Ind. II. 535; DC. Prod. VIII. 233; Wight Icon. t. 189; Hiern Monogr. Eben. 235.

HAB. Rather rare in the tropical forests of Arracan; also Chittagong.

6. D. OLEIFOLIA, Wall. Cat. 4128; Kurz in Journ. As. Soc. Beng. 1871, 72; Hiern Monogr. Eben. 204.

HAB. Frequent in the tropical forests of Martaban and Upper Tenasserim.—Fl. March, April; Fr. RS.

7. D. KURZII, Hiern Monogr. Ebenac. 162.

HAB. Frequent in the tropical and moister upper mixed forests of the Andamans.—Fl. May, June; Fr. Febr.—April.

8. D. MOLLIS, Griff. in Journ. Agr. Hort. Soc. Beng. III. 145. c. icon.

HAB. Frequent in the drier hill-forests of Martaban, at 2—4000 ft. elevation; Ava, Khakyen hills.—Fl. March.

9. D. MONTANA, Roxb. Corom. Pl. I. 37. t. 48; DC. Prod. VIII. 230; Wight Icon. t. 1225 and Illustr. t. 148; Hiern. Monogr. Eben. 220.

Var. α. GENUINA, Hiern. l. c. 222. (*D. heterophylla*, Wall. ap. DC. Prod. VIII. 230, *teste* Hiern).

Var. β. CORDIFOLIA, Hiern l. c. 222. (*D. cordifolia*, Roxb. Corom. Pl. I. 38. t. 50 and Fl. Ind. II. 538; DC. Prod. VIII. 230; Wight Illustr. t. 148; *D. punctata*, Dcne. Hb. Timor. Descr. 79; DC. l. c.; Miq. Fl. Ind. Bat. II. 1046; *D. Waldemarii*, Klotzsch in Waldem. Reise 101. t. 55).

HAB. Frequent in all leaf-shedding forests, especially the dry and eng-forests, of Ava, Prome, and Pegu.—Fl. April, March; Fr. Decb.—Febr.

A variety of this (in the analytical key separated as *D. cordifolia*?) is frequent in the mixed forests of Pegu. It has the leaves much larger (3—4 in. long), but offers (in fruit only) no tangible characters for specific separation. I rely upon the rumination of seeds as little in *Diospyros* as in *Calameæ*.

10. D. BURMANICA, Kurz in Journ. As. Soc. Beng. 1871. 73; Hiern Monogr. Ebenac. 166.

HAB. Common in the dry and open, especially the eng-forests of Prome and Ava; less frequent in those of Pegu and Martaban.—Fl. March, April; Fr. Dec., Jan.

11. D. RHODOCALYX, Kurz in Journ. As. Soc. Beng. 1871. 71; Hiern Monogr. Eben. 241.

HAB. Siamese provinces of Radburi and Kanburi (Teysmann).—Fl. HS.

Habit and affinity of *D. chloroxylon*,

12. D. DENSIFLORA, Wall. Cat. 4140; DC. Prod. VIII. 233; Hiern Monogr. Eben. 171.

HAB. Rather rare in the tropical forests of Arracan and Martaban; also Tenasserim.—Fl. Febr.; Fr. March.

13. D. HORSFIELDII, Hiern Monog. Eben. 193.

HAB. Tenasserim (Helf. 3620), *teste* Hiern.

14. D. FLAVICANS, Hiern Monog. Eben. 205 (*Ebenacea* 2, Griff. Not. Dicot. 291.)

HAB. Tenasserim (Helfer 3623 and 3639, 3640).

Helfer's No. 3632 (not seen by me) from Tenasserim or the Andamans is referred by Hiern to *D. Moonii*, Thw. (*D. hirsuta*, L.). I fear there is a mistake.

15. D. UNDULATA, Wall. Cat. 4136; DC. Prod. VIII. 233; Hiern Monog. Ebenac. 216.

HAB. Not unfrequent in the tropical forests of Martaban, Tenasserim and the Andamans.—Fr. April, May; Fr. Octob.—Febr.

16. D. SAPOTOIDES, Kurz in Journ. As. Soc. Beng. 1873 88.; Hiern Monog. Ebenac. 206.

HAB. Frequent in the tropical forests of the eastern slopes of the Pegu Yomah (especially along the Choungmeneh choung, Khaboung).—Fl. April.

17. D. LANCEÆFOLIA, Roxb. Fl. Ind. II. 537; DC. Prod. VIII. 232; Hiern Monogr. Ebenac. 213.

HAB. Upper Tenasserim, Moulmein (Falconer).—Fl. March.

18. D. PYRRHOCARPA, Miq. Suppl. Fl. Sumatr. 583; Hiern Monog. Eben. 266.

? Var. *β*. ANDAMANICA, leaves oblong to narrow-oblong, the lateral nerves faint and numerous, net-venation more lax.

HAB. Var. *β*. Rather rare in the tropical forests of the Andamans.—Fl. May.

The Andaman tree, I have little doubt, is a different species, but the material is too incomplete for description.

19. D. VARIEGATA, Kurz in Journ. As. Soc. Beng. 1871. 73; Hiern Monogr. Eben. 203.

HAB. Not unfrequent in the moister upper mixed and the tropical forests of Pegu and Martaban, up to 1000 ft. elevation.—Fl. April.

20. D. STRICTA, Roxb. Fl. Ind. II. 539; DC. Prod. VIII. 232, Hiern Monogr. Eben. 201.

HAB. Chittagong (Hf. and Th.); Tipperah (Roxburgh).

21. D. BRANDISIANA, Kurz in Journ. As. Soc. Beng. 1871. 72; Hiern Monog. Eben. 184.

HAB. Upper Tenasserim, Domdamee forests (Brandis); Ava, Khakyen hills (J. Anderson).—Fl. Febr., March.

22. D. DASYPHYLLA, Kurz in Journ. As. Soc. Beng. 1871. 71; Hiern Monogr. Eben. 203.

HAB. Martaban, Taëpo hills, at 4000 ft. elevation (Brandis).

STYRACEÆ.

Conspectus of Genera.

STYRAX. Calyx somewhat enlarging and enclosing the fruit for one half. Corolla slightly twisted or almost valvate in bud. Stamens 10, the anthers elongate. Drupe dry, sometimes valvately dehiscing.

SYMPLOCOS. Calyx wholly or nearly wholly adnate to the ovary. Corolla-lobes imbricate in bud. Stamens numerous, indefinite, the anthers short. Drupe more or less succulent, crowded by the calyx-limb.

Styrax, L.

Conspectus of Species.

* *All parts more or less tomentose, the under-surface of the leaves particularly so.*

Leaves white-tomentose beneath; calyx slit spathe-like, conspicuously subulate-toothed, ... *S. rugosum.*

* * *Younger parts more or less tomentose; leaves sparingly and minutely stellate-puberulous, glabrescent and green.*

Calyx 5- or 6-toothed; corolla-lobes narrow-oblong, about 4 lin. long; leaves serrulate. ..*S. serrulatum.*

Calyx truncate and minutely toothed; corolla-lobes ovate, nearly ¾ in. long; leaves remotely and minutely toothed, ... *S virgatum.*

1. S. RUGOSUM, Kurz in Journ. As. Soc. Beng. 1871. 61.

HAB. Martaban, on the hills between the Sittang and Salween, at 4000 ft. elevation (Dr. Brandis).—Fl. May.

2. S. SERRULATUM, Roxb. Fl. Ind. II. 415; DC. Prod. VIII. 267; Bot. Mag. t. 5950. (*S. floribunda*, Griff. Not. Dicot. 287 ?)

HAB. Chittagong (Roxb.); Ava, Khakyen hills (J. Anderson); (Tenasserim, between Kulweng and Mergui, Griff.)—Fl. March; Fr. Octob.

3. S. VIRGATUM, Wall. Cat. 4400; DC. Prod. VIII. 267.—(*S. grandiflorum*, Griff. Not. Dicot. 287. t. 423).

HAB. Burmah (Griff. 3671), probably Ava.

Symplocos, L.

Conspectus of Species.

* *Ovary 3-celled. Drupes oblong or elliptical, 3-celled. Embryo straight.*

× Drupes sulcate-ribbed.

Young parts more or less rusty-pubescent; flowers sessile or nearly so, in simple tomentose spikes, ... *S. sulcata.*

× × Drupes smooth and terete.

† Racemes or spikes not glabrous.

Glabrous ; flowers sessile, in compound puberulous spikes, ... *S. lucida.*

Young shoots more or less pubescent ; flowers shortly pedicelled, in simple or branched villous-tomentose racemes, ... *S. racemosa.*

† † Racemes quite glabrous.

Glabrous ; petioles and rib beneath sparingly hairy ; racemes slender, ..*S. leiostachya.*

* * *Ovary 2- rarely 3-celled. Drupes more or less turbinate or obversely pear-shaped, by abortion usually 1-seeded, the endocarp often intruding so as to cause the seed to be more or less curved. Embryo curved.*

× Stamens in 2 or more series, not fascicled.

† Flowers sessile, in simple or compound spikes.

O Drupes ribbed or torulose.

Young shoots, spikes, and leaves beneath more or less rusty pubescent or tomentose ; drupes ribbed, ... *S. Javanica.*

Glabrous ; spikes glabrous ; drupes torulose-ribbed, ... *S. spicata.*

O O Drupes terete and smooth.

Glabrous, also the spikes ; drupes ovoid-turbinate, ...*S. polycarpa.*

† † Flowers pedicelled, in simple or compound racemes. Drupes terete.

Glabrous ; racemes compound, minutely appressed pubescent, stout ; drupes ovoid-turbinate (unripe), ... *S. pedicellata.*

Glabrous ; leaves caudate acuminate ; racemes simple, slender, pubescent ; drupes ovoid-turbinate, ... *S. caudata.*

× × Stamens collected into 5 bundles. Flowers white.

Racemes shortly tomentose, short ; pedicels very short and thick, ...*S. leucantha.*

Racemes appressed pubescent, forming slender panicles ; pedicels long, filiform, ..*S. cratægoides.*

1. S. SULCATA, Kurz in Journ. As. Soc. Beng. 1871. 65.

Var. *α.* GLABRIOR, leaves more coriaceous, quite glabrous and shining above ; drupes larger and glabrous.

Var. *β.* PUBESCENS, leaves narrower and longer acuminate, less glossy and almost opaque, pubescent on the midrib beneath ; young shoots rusty villous-tomentose ; drupes (unripe) pubescent.

HAB. Not rare in the drier hill-forests of Martaban, at 3000 to 6000 feet elevation ; var. *β.* Upper Tenasserim, Daunat pass, 4000 ft. (Dr. Brandis).—Fr. March.

2. S. LUCIDA, Wall. Cat. 4414 ; DC. Prod. VIII. 255.

HAB. Not unfrequent in the hill-forests of Martaban, especially on the Nattoung ridges, at 5—7000 ft. elevation.—Fl. March.

3. S. RACEMOSA, Roxb. Fl. Ind. II. 539 ; DC. Prod. VIII. 255. (*S. Hamiltoniana*, Wall. Cat. 4420 ; DC. l. c. 254).

Var. *α.* ROXBURGHIANA, racemes usually simple or nearly so, leaves quite glabrous (*S. rigida*, Wall. Cat. 4422), or the midrib beneath slightly appressed pubescent.

Var. *β.* COMPOSITA, racemes more or less branched ; leaves glabrous.

HAB. Rather frequent in the open and dry forests, all over Ava and

Pegu down to Martaban and Upper Tenasserim, up to 2000 ft. elevation.—Fl. Jan., Febr.

4. S. LEIOSTACHYA, Kurz in Journ. As. Soc. Beng. 1873. 89. and in Trim. Journ. Bot. 1875. 329.

HAB. Tenasserim (Helf. 3656).

5. S. JAVANICA, (*Dicalyx Javanicus*, Bl. Bydr. 1117; *S. ferruginea*, Roxb. Fl. Ind. II. 542; DC. Prod. VIII. 257; Miq. Fl. Ind. Bat. I/2. 466; *S. rubiginosa*, Wall. ap. DC. l. c.; *S. Horsfieldiana*, Miq. Suppl. Fl. Sumatr. 475, auctore ipso "foliis latioribus" tantum differt).

HAB. Tenasserim (Helf. 3645).

6. S. SPICATA, Roxb. Fl. Ind. II. 541; DC. Prod. VIII. 254, non Bth. Fl. Austr.

HAB. Tenasserim (Helf. 3660 and 3664), from Moulmein southwards.—Fl. Aug.

If *Myrtus laurina*, Retz. Obs. IV. 27, is really the same as Roxburgh's plant, the specific name will have to be changed in favour of Retz's.

7. S. POLYCARPA, Wall. Cat. 4423 A. and B.; DC. Prod. VIII. 255. (*S. attenuata*, Wall. Cat. 4426; DC. l. c. 256).

HAB. Frequent in the hill-forests of Martaban, especially Nattoung ridges, Taipo &c., at 4—5000 ft. elevation; Tenasserim, from Moulmein (Falconer) to Tavoy (Wall.).—Fl. Febr., Aug.

8. S. PEDICELLATA, Kurz in Journ. As. Soc. Beng. 1873. 89.

HAB. Rare in the tropical forests of Toukyeghat east of Tounghoo, Martaban.—Fr. April, May.

9. S. CAUDATA, Wall. Cat. 4413; DC. Prod. VIII. 256.

HAB. Chittagong (Hf. and Th.); Upper Tenasserim, Taoo road (Dr. Brandis).—Fr. April.

10. S. LEUCANTHA, Kurz in Journ. As. Soc. Beng. 1873. 89.

HAB. Frequent in the swamp-forests between the Irrawaddi and Lhein rivers of Pegu.—Fl. Jan.

11. S. CRATÆGOIDES, D. Don. Fl. Napal. 145; DC. Prod. VIII. 258.

HAB. Martaban, Nattoung hills (Rev. F. Mason).

OLEACEÆ.

Conspectus of Genera.

Subord. I. OLEACEÆ. Stamens 2 only, situated between a pair of corolla-lobes.

Trib. 1. *JASMINEÆ.* Corolla-limb 5—12-lobed. Ovules erect.

* *Fruit a dry compressed capsule.*

NYCTANTHES. Corolla twisted in bud. Albumen none. Scabrous trees, with simple leaves.

* * *Fruit a 2- or by abortion 1-lobed drupe.*

Jasminum. Corolla twisted in bud. Albumen none. Shrubs, usually scandent, rarely trees; leaves simple or compound.

Trib. 2. *OLEFÆ.* Corolla 4-lobed, rarely 6—8-cleft or wanting, with or without a tube. Ovules pendulous or attached laterally near the summit of the cell.

* *Corolla-lobes twisted in bud. Ovules pendulous. Fruit a dry capsule or samara.*

Schrebera. Corolla salver-shaped. Ovary 2-celled, with 3—4 ovules in each cell. Capsule 2-valved. Seeds winged. Albumen none. Trees or shrubs, the leaves pinnate or rarely simple.

* * *Corolla lobes valvate in bud or nearly so, rarely imbricate. Fruit drupaceous or berry-like. Leaves simple.*

× Corolla-lobes more or less imbricate.

Osmanthus. Corolla-lobes blunt. Endocarp of drupes thin. Flowers clustered, axillary.

× × Corolla-lobes induplicate-valvate.

Chionanthus. Petals usually elongate, free or very shortly united at the base. Seeds with or without albumen. Trees; inflorescence various.

Olea. Ovary-cells 2-ovuled. Seeds albuminous. Panicles axillary or terminal. Trees or shrubs, erect.

Myxopyrum. Flowers minute, in axillary panicles. Seeds albuminous. Woody climber, with sharply 4-cornered branches.

Subord. II. SALVADORACEÆ. Corolla 4-parted, without tube. Stamens 4, alternating with the corolla-lobes. Ovules erect.

Azima. Petals free, linear. Stamens free. Ovary 2-celled, the cells 2-ovuled. Shrubs, spiny armed.

Nyctanthes, L.

1. N. Arbor tristis, L. sp. pl. ed. 2. 8; Roxb. Fl. Ind. I. 86; Bot. Reg. t. 399; DC. Prod. VIII. 314; Bot. Mag. t. 4900; Bedd. Sylv. Madr. t. 240.

Hab. Rare in the low forests above Rangoon; Ava, Irrawaddi valley (J. Anderson); Tenasserim (Helf. 3697) cult. ?—Fl. Fr. CS.

Jasminum, L.

Conspectus of Species.

Ser. 1. *Unifoliolatæ.* Leaves simple, with a jointed petiole.

* Bracts minute or short and filiform, rarely wanting.

× Calyx-lobes short, or the calyx almost truncate.

+ Flowers corymbose.

Glabrous; pedicels 2—5 lin. long; calyx 5-cornered, almost truncate, ... *J. extensum.*

Pubescent; flowers sessile; calyx-teeth as long as the calyx-tube, ... *J. decussatum.*

+ + Flowers in poor axillary racemes; pedicels ½—1. long; calyx-teeth distinct.

† Corolla-lobes blunt, glabrous.

Nerves conspicuous on both sides, usually with a gland in the axils; corolla-lobes usually 8, rarely 5—7, ... *J. subglandulosum.*

Nerves thin and obsolete, without glands; corolla-lobes usually 5, ... *J. attenuatum.*

† † Corolla-lobes acuminate.

Glabrous ; leaves more or less narrow, very long acuminate ; corolla-lobes 9—12, .. *J. laurifolium.*

× × Calyx-lobes longer than the calyx-tube, subulate.

Small shrub, almost erect ; branchlets puberulous ; leaves penninerved, ...*J. Sambac.*

Twining, glabrous ; leaves 3-nerved, ...*J. anastomosans.*

* * *Bracts leafy, conspicuous, shorter or longer than the calyx.*

× Bracts longer than the calyx, leafy, white-discoloured.

More or less pubescent, especially the branchlets ; corolla-tube about ½ in. long or longer, ...*J. Rottlerianum.*

Glabrous when adult, tufted-hairy in the nerve-axils beneath ; corolla-tube about an in. long, ...*J. coarctatum.*

× × Bracts shorter than the calyx ; calyx-lobes subulate ; pedicels 1—2 lin. long.

More or less pubescent ; corolla- and calyx-lobes each 6—9, the latter 4—5 lin. long, pubescent, ...*J. hirsutum.*

Glabrous or puberulous ; corolla- and calyx-lobes each 6—7, the latter only a line long, more or less pubescent, ...*J. scandens.*

Ser. 2. *Foliolatæ.* Leaves unpaired-pinnate or pinnately 3-foliolate, rarely occasionally 1-foliolate.

Glabrous ; leaves unpaired-pinnate ; calyx-lobes subulate, about 3—4 lin. long, .. *J. grandiflorum.*

1. J. EXTENSUM, Wall. Cat. 2862 ; DC. Prod. VIII. 308.

HAB. Ava, towards the base of the Taong-dong (Wall.).—Fl. Fr. Nov.

2. J. DECUSSATUM, Wall. Cat. 2860 ; DC. Prod. VIII. 306.

HAB. Not unfrequent in the tropical forests, from Martaban down to Upper Tenasserim, up to 3000 ft. elevation.—Fl. Febr. ; Fr. March.

3. J. SUBGLANDULOSUM, Kurz in Trim. Journ. Bot. 1875. 329, and For. Fl. Burm. II. 151.

HAB. Not unfrequent in the tropical forests of the southern slopes of the Pegu Yomah above Rangoon ; Tenasserim ; South Andamans.—Fl. Decb. ; Fr. Febr.

4. J. ATTENUATUM, Wall. Cat. 2864 ; DC. Prod. VIII. 309.

HAB. Not unfrequent in the damp hill-forests of Martaban, especially the Nattoung mountains, at 5000 to 7200 ft. elevation.—Fl. Fr. March.

5. J. LAURIFOLIUM, Roxb. Fl. Ind. I. 91 ; DC. Prod. VIII. 303.

Var. α. GENUINUM, calyx-lobes up to 4 lin. long, much longer than the calyx-tube.

Var. β. BRACHYLOBUM, calyx-lobes as long or a little longer than the calyx-tube, more or less recurved.

HAB. Var. β. frequent in the tropical forests of Martaban and Tenasserim ; Ava, Khakyen hills (J. Anderson).—Fl. Febr.—April ; Fr. April, May.

6. J. Sambac, Ait. Hort. Kew. ed. 1. I. 8; Wight Icon. t. 704; DC. Prod. VIII. 301; Bot. Reg. t. 1 and t. 497.—(*J. quinqueflorum*, Heyne ap. DC. Prod. VIII. 302.)

Hab. Frequently cultivated all over Burma and often met with in neglected lands, poonzohs and rubbishy places near villages, but apparently not really wild. Said to be wild in Prome district.—Fl. March, April.

7. J. anastomosans, Wall. Cat. 2863; DC. Prod. VIII. 305.

Hab. Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and in those from Martaban down to Tenasserim.—Fl. March, April.

8. J. Rottlerianum, Wall. Cat. 2865; DC. Prod. VIII. 305; Wight Icon. t. 1249.

Hab. Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah, especially along the Choungmenah choung (Khaboung). Fl. April.

9. J. coarctatum, Roxb. Fl. Ind. I. 91; DC. Prod. VIII. 308. (*J. reticulatum*, Wall. Cat. 2869; DC. Prod. VIII. 303).

Hab. Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and in those of Martaban east of Tounghoo; also hills of Chittagong.—Fl. April, May.

Roxburgh's plant has the calyx 5-lobed while Wallich's has it usually 8-lobed.

10. J. hirsutum, Willd. sp. pl. I. 36; Smith Exot. Bot. II. 117. t. 118; Wight Icon. t. 702; Bot. Mag. t. 1931; Bot. Reg. t. 15. (*Nyctanthes hirsuta*, L. sp. pl. 8; *J. multiflorum*, Andr. Bot. Repos. t. 496, non Roth; *J. pubescens*, Willd. sp. pl. I. 37; Roxb. Fl. Ind. I. 91; DC. Prod. VIII. 302).

Hab. Ava, Bhamo (J. Anderson); Pegu (Dr. Brandis).—Fl. Jan.

11. J. scandens, Vhl. Symb. III. 2; DC. Prod. VIII. 306; Roxb. Fl. Ind. I. 89. (*J. syringæfolium*, Wall. Cat. 2861; DC. Prod. VIII. 306.)

Var. α. genuinum, all parts more glabrous, the branchlets and leaves especially so.

Var. β. lætum, (*J. lætum*, Wall. Cat. 2859; DC. Prod. VIII. 306), the branchlets, nerves of the leaves, and sometimes also the under-surface of the leaves themselves puberulous.

Hab. Frequent in all leaf-shedding forests, especially the tropical and open ones, all over Burmah, from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. Dec.—Febr.; Fr. April, May.

12. J. grandiflorum, L. sp. pl. 9; DC. Prod. VIII. 313; Bot. Reg. t. 91; Roxb. Fl. Ind. I. 100.

Hab. Burmah (accord. Rev. F. Mason.)

Schrebera, Roxb.

1. Sch. swietenioides, Roxb. Corom. Pl. II. 1. t. 101 and Fl. Ind. I. 109; DC. Prod. VIII. 675; Bedd. Sylv. Madr. t. 248.

Var. *α.* genuinum, all parts glabrous, also the inflorescences, calyxes and corollas; capsules 2 in. long.

Var. *β.* pubescens, (*Sch. pubescens*, Kurz in Flora 1872. 399), all younger parts and inflorescence softly pubescent; calyx densely and minutely tomentose; corolla sparingly puberulous outside; capsules much smaller.

Hab. Var. *α.* not unfrequent in the mixed forests all over Pegu and Martaban, entering also the savannahs.—Fl. April; Fr. Jan.

Chionanthus, L.

(*Linociera*, Swartz).

Conspectus of Species.

* *Petals or corolla-lobes very narrow, involute.*

Glabrous; nerves prominent beneath; petals $\frac{2}{3}$ lin. long, ... *Ch. minutiflorus.*

* * *Petals or corolla-lobes broader, flat or concave, but not involute.*

× Veins visible between the strong lateral nerves. (Leaves 3—6 in. long).

Panicle ample, leafy-bracted; nerves impressed on the upper side of the leaves; drupes 1—1$\frac{1}{2}$ in. long, ... *Ch. Palembanicus.*

Panicles rather small, with minute bracts; nerves prominent on both sides; drupes $\frac{1}{2}$ in. long, ... *Ch. macrophyllus.*

× × No visible veins between the nerves. (Leaves 6—10 in. long.)

Panicle minutely puberulous; petals linear; drupes about an in. long, .. *Ch. montanus.*

1. Ch. minutiflorus, Kurz in For. Fl. Burm. II. 159.

Hab. Martaban hills east of Tounghoo (Dr. Brandis).

2. Ch. Palembanicus, Miq. Suppl. Fl. Sumatr. 558; Kurz in Journ. As. Soc. Beng. 1876. 139.

Hab. Not unfrequent in the coast-forests of the Andamans.—Fl. May, June.

3. Ch. macrophyllus, (*Linociera macrophylla*, Wall. Cat. 2826. A.; DC. Prod. VIII. 297; *Linociera attenuata*, Wall. Cat. 2839; *Linociera picrophloja*, F. Muell. Fragm. III. 139. t. 24?).

Hab. Ava (J. Anderson); Pegu (Brandis); tropical forests of Upper Tenasserim (Wall.).—Fr. Jan.

4. Ch. montanus, Bl. Bydr. 681; Miq. Fl. Ind. Bat. II. 552. (*Ch. insignis*, Miq. Suppl. Fl. Sumatr. 559).

Hab. Rather rare in the hill-eng-forests of Martaban east of Tounghoo, at 1500 to 2000 ft. elevation; Upper Tenasserim (Falconer; Helf. 3688).

Doubtful Species.

1. *Linociera? oblonga*, Wall. Cat. 2844; DC. Prod. IV. 298.

Hab. Ava, Taong-dong.

2. *L.? loranthifolia*, Wall. Cat. 2842; DC. Prod. VIII. 298.

Hab. Upper Tenasserim, Amherst.

The fragments seen by me look Olacinaceous.

Olea, Tournef.

Conspectus of Species.

* *Corolla almost rotate, the limb spreading. Inflorescence axillary, or at the same time terminal.* (Olea, *L.*)

× Petals only a line long or thereabouts.

Leaves rigidly coriaceous, the nerves prominent; panicle glabrous, ... *O. dentata.*

Leaves thin-coriaceous, the nerves prominent; panicles glabrous, ... *O. dioica.*

× × Petals about 3 lin. long.

Leaves veinless between the nerves; drupes nearly ½ in. long, ... *O. terniflora.*

* * *Corolla funnel-shaped, with a longer or shorter tube. Panicles all terminal.* (Ligustrum, *Tournef.*)

Panicles glabrous or pubescent; drupe 3—4 lin. long, ... *O. robusta.*

1. O. DENTATA, Wall. Cat. 2840; DC. Prod. VIII. 286.—(*O.? salicifolia*, Wall. Cat. 2821; DC. l. c.).

Hab. Frequent in the drier hill-forests and the hill-eng-forests of Martaban and Upper Tenasserim, at 2000 to 3000 ft. elevation; also in the tropical forests above Rangoon.—Fl. June—Jan.; Fr. April, May.

2. O. DIOICA, Roxb. Fl. Ind. I. 106; DC. Prod. VIII. 286.

Hab. Hills of Chittagong.—Fl. March, Apr.; Fr. July.

3. O. TERNIFLORA, (*Linociera? terniflora*, Wall. Cat. 2845; DC. Prod. VIII. 297; *Linociera? acuminata*, Wall. Cat. 2844; DC. l. c. 298; *O. linoceroides*, Wight Icon. t. 1241?)

Hab. Frequent in the tropical and moister upper mixed forests of the Pegu Yomah and from Martaban down to Tenasserim; also Chittagong. —Fl. Dec., Jan.; Fr. Jan.

4. O. ROBUSTA (*Phillyrea robusta*, Roxb. Fl. Ind. I. 101; *Visiania robusta*, DC. Prod. VIII. 289; *Ligustrum robustum*, Kurz Pegu Rep. App. A. 88.)

Var. *α.* GENUINA, panicle puberulous and more or less glabrescent; leaves glabrous.

Var. *β.* PUBESCENS (*Ligustrum pubescens*, Wall. Pl. As. rar. III. 44 in adnot.; DC. Prod. VIII. 294; *Visiania Sumatrana*, Miq. Fl. Ind. Bat. II. 549; *Ligustrum punctatum*, Griff. Not. Dicot. 741).

Hab. Hills of Pegu (Brandis); Chittagong; Var. *β.* Ava, Taong-dong (Wall.) and in forests around Moulmein, Upper Tenasserim (Griff.). Fl. July, Aug.; Fr. Nov., Decb.

Myxopyrum, Bl.

1. M. SMILACIFOLIUM, Bl. Mus. Lugd. Bat. I. 320.—(*Chondrospermum smilacifolium*, Wall. Cat. 2837 ; DC. Prod. VIII. 301 ; *Chionanthus ? smilacifolius*, Wall. in Roxb. Fl. Ind. I. 108).

Var. α. GENUINUM, leaves more or less entire or remotely and minutely spinescent-toothed ; panicle ample, slender, as long as or longer than the leaves.

? Var. β. ILICIFOLIUM, leaves somewhat narrower and stronger nerved and veined, strongly and crowdedly spinose-serrate ; panicles rather contracted, not above 2 in. long, axillary and leaf-opposed, rarely terminal, the peduncle and branchings strong and 4-cornered.

HAB. Var. α. in the forests of Chittagong ; var. β. rather frequent in the tropical forests of Martaban and in those of the Andaman and Cocos-islands.—Fl. April, May.

Chondrospermum ? coriaceum, Wall. Cat. 2838 ; DC. Prod. VIII. 301. (nomen nudum), from Ava, Taong-dong, is unknown to me.

Azima, Lamk.

1. A. TETRACANTHA, Lamk. Encycl. Bot. I. (1783) 343 ; Poir. in Lamk. Ill. Gen. III. (1823) 401 t. 807.—(*Monetia barlerioides*. L'Her. Stirp. Nov. I. (1784) I. t. 1 ; Tulasn. in Ann. d. sc. nat. 4 ser. VIII. 113 ; Miq. Fl. Ind. Bat. I/2 596 ; *Fagonia montana*, Miq. Fl. Ind. Bat. I/2. 496, *teste* Hf.).

HAB. Frequent in the dry forests and shrubberies of Ava and Prome, occasionally entering the savannahs.—Fr. March.

APOCYNACEÆ.

Conspectus of Species.

Ser. I. GYMNOSPERMÆ. Seeds naked, *i. e.*, without a deciduous tuft of hairs at their extremities, sometimes persistently hairy-fringed all round, more so at the extremities. Anthers free.

* *Corolla valvate in bud.*

Trib. 1. *STRYCHNEÆ.* Ovary entire, 2-celled, with axile placentas.

STRYCHNOS. Corolla-throat naked or bearded. Berry corticate or sappy, the seeds imbedded in pulp. Albumen horny. Trees or scandent shrubs.

* * *Corolla twisted-imbricate in bud.*

Trib. 2. *CARISSEÆ.* Ovary entire, 2—1-celled, with axile or parietal placentas.

* *Ovary* 1-*celled, with* 2 *parietal placentas.*

× Fruit an indehiscent drupe or berry.

CHILOCARPUS. Corolla-throat naked. Seeds in pulp. Albumen horny. Scandent shrubs.

WILLUGHBEIA. As preceding, but seeds without albumen. Scandent shrubs.

× × Fruit a dehiscent capsule.

Allamanda. Corolla-throat with scales, the anthers included in the tube; albumen scanty. Erect shrubs, with showy 5-merous flowers.

* * *Ovary, 2-celled, with axile placentas.*

× Corolla-throat furnished with 5 or 10 scales or appendages. Disk none.

Thevetia. Calyx many-glanded inside. Drupe unequally 2-celled, not pulpy. Trees or shrubs, with large flowers.

Melodinus. Calyx glandless inside. Drupe incompletely 2-celled, the seeds in pulp. Albumen fleshy. Scandent shrubs.

× × Corolla-throat naked.

Carissa. Corolla salver-shaped, hairy within. Style short or filiform. Ovary-cells 1—4, rarely many-ovuled, the ovules in 2 rows. Berry 3—1-celled, sappy. Albumen fleshy. Shrubs or trees, usually spiny-armed.

Winchia. Apparently like preceding, but the style deeply 2-cleft and the ovules in numerous rows. Unarmed, with ternary leaves.

Trib. 3. *PLUMERIEÆ.* Ovary consisting of 2 more or less distinct carpels, each with a single placenta.

* *Fruit-carpels indehiscent, not follicular.*

× Calyx gamosepalous.

Rauwolfia. Calyx toothed. Corolla elongate-funnel-shaped. Disk cupular or annular. Drupes sappy, usually connate at the base or up to the middle. Albumen fleshy. Herbs, under-shrubs, or shrubs.

Ochrosia. Calyx toothed or lobed. Disk none or obsolete. Drupes usually paired, fleshy-fibrous. Trees or shrubs.

× × Sepals free, reflexed.

Cerbera. Calyx glandless inside. Disk none. Drupes usually single by abortion, fibrose-woody. Trees.

* * *Fruit-carpels follicular, dehiscing along the ventral suture; rarely indehiscent. Corolla-throat naked.*

× Seeds in no way winged nor hairy-fringed.

† Seeds not imbedded in pulp.

‡ Albumen none.

Kopsia. Follicle elliptical to oblong, indehiscent, 1-seeded. Trees.

Calpicarpum. Follicle broad, obliquely truncate, slowly dehiscing, 1-seeded. Shrubs.

‡ ‡ Albumen present.

Vinca. Follicle elongate-linear, continuous, many-seeded. Albumen fleshy. Erect shrubs or under-shrubs.

Gynopogon. Follicle elongate, moniliform-contracted between the seeds. Albumen horny, homogeneous. Shrubs, more or less twining.

Hunteria. As preceding, but albumen ruminate.

† † Seeds imbedded in pulp.

Tabernæmontana. Follicles continuous, several-seeded. Albumen none. Disk none. Erect shrubs.

× × Seeds winged or hairy-fringed.

Plumieria. Disk none or fleshy and adnate to the calyx. Follicles elongate, many-seeded. Seeds winged. Albumen none. Fleshy trees.

Alstonia. Corolla salver-shaped. Anthers included. Seeds fringed all along the borders, more so at both extremities. Albumen scanty. Trees or shrubs.

Ser. II. COMESPERMÆ. Seeds furnished at one or both ends with a deciduous tuft or crown of long silky hairs; anthers usually cohering in a cone.

Trib. 4. *ECHITIDEÆ.* Characters as above.

* *Corolla-throat naked, without scales. Seeds comose at the apex only or rarely fringed all round.*

× Disk annular, cupular, or consisting of 5 free or connate scales. Scandent shrubs.

+ Ovary entire, 2-celled.

† Anthers included.

Beaumontia. Calyx-segments leafy. Disk-glands 5, free or connate. Albumen fleshy. Flowers large and showy.

† † Anthers more or less exserted.

Vallaris. Calyx small. Corolla almost rotate-bell-shaped. Disk 5-lobed. Albumen scanty. Flowers rather showy.

Parsonsia. Calyx small. Disk-scales 5, free or connate. Filaments often spirally twisted. Flowers small.

+ + Ovary-carpels 2, distinct.

† Anthers exserted, cohering in a cone round the stigma.

Pottsia. Disk 5-lobed. Flowers small, panicled.

† † Anthers included in the corolla-tube. Disk cupular or 5-cleft.

O Corolla induplicate-valvate.

Urceola. Corolla urceolate or globose. Calyx glandless inside. Disk entire or 5-lobed. Flowers small.

O O Corolla twisted-imbricate.

‡ Seeds narrowed at apex into a long slender neck.

§ Follicle moniliform.

Parameria. Corolla salver- or almost bell-shaped. Calyx many-glanded inside. Flowers small.

§ § Follicle continuous, not moniliform.

Ecdysanthera. Corolla almost urceolate, the lobes sinistrorsely twisted. Disk entire or 5-lobed. Flowers small.

Anodendron. Corolla salver-shaped, the lobes narrow. Disk truncate or 5-lobed. Follicle woody-coriaceous. Seeds albuminous. Flowers small.

Cercocoma. Corolla salver-shaped, the lobes broad. Disk 5-cleft. Follicle coriaceous. Albumen none. Flowers rather showy.

‡ ‡ Seeds not contracted into a long neck.

§ Ovary-carpels more or less immersed in the fleshy disk.

Aganosma. Calyx large and leafy, divided almost to the base. Disk-lobes short. Anthers appendaged. Flowers large and showy.

Ichnocarpus. Corolla salver-shaped. Disk-lobes on the top of the ovary, distinct. Flowers small. Calyx gamosepalous, 5-toothed.

Epigynum. Corolla salver-shaped. Disk-lobes epigynous round the ovary and almost connate.

§ § Ovary entirely superior.

Shrubby annual; leaves small, sessile with broad base and almost half-stem-clasping; involucre-bracts narrowed into filiform tails; peduncles almost glabrous, .. *B. amplectens.*

Low perennial, branched and ascending from the base; thinly pubescent; peduncles spreadingly pubescent; involucre-bracts very acute; leaves rather large, sessile with a rounded base, ... *B. bifoliata.*

× × Flower-heads in panicles, racemes, or rarely densely packed into shorter or longer spikes.

+ Serratures or teeth of the leaves spiny indurated at their tips.

Spreading perennial, branched from the base and procumbent, sparingly pilose; leaves small, the serratures few and coarse; flower-heads few, forming irregular depauperate panicles, ... *B. oxyodonta.*

Erect, simple or branched annual, more or less appressed silky-pilose; leaves rather large, doubled-spiny-serrulate; flower-heads in regular panicles, ... *B. spinello*

+ + Serratures or teeth of the leaves various, but never spin indurated.

† Herbs, or biennials, simple or branched from the base, and more or less villous, pubescent, or viscid-puberulous, rarely almost glabrous.

O Flower-heads irregularly disposed and more or less peduncled, forming panicles or rarely the panicle contracted.

△ Receptacle glabrous.

‡ Florets blue to violet, rarely bluish white.

Tall herb, reduced and small, more or less viscid-pubescent; leaves simple and petioled; flower-heads only 2 lin. long, on shorter or longer filiform peduncles, forming lax panicles, ... *B. Wightiana.*

‡ ‡ Florets all yellow. Flower-heads in lax panicles. Peduncles slender, although sometimes very short. Annuals, rarely becoming biennials.

Erect, branched from the base, more or less silky-villous, but not viscid, the cauline leaves simple and sessile or nearly so; flower-heads 3—3½ lin. long, in panicles sometimes pretty contracted but elongate, ... *B. lacera.*

Erect, branchy, thinly viscid-pubescent, the cauline leaves simple and petioled; flower-heads about 4 lin. long, on long slender glandular peduncles, forming lax panicles, .. *B. glandulosa.*

Erect, branchy, thinly puberulous, the cauline leaves (except in starved states) almost runcinate and petioled; flower-heads about 3 lin. long with the involucral-bracts green and glabrous, on spreading stiff capillary glabrous or glandular peduncles, in lax panicles, ... *B. diffusa.*

Erect, simple or branched, almost glabrous or usually more or less hirsute, the cauline leaves (especially the lower ones) more or less runcinate; flower-heads nearly 4 lin. long, with the involucral-bracts and the long slender peduncles pubescent, in lax panicles, ... *B. lactucæfolia.*

△ △ Receptacle hairy. Peduncles slender.

Branched or simple annual, shortly or rarely glandular-pubescent, the cauline leaves usually runcinate; flower-heads about 3½ lin. long, longer or shorter peduncled, forming lax leafless panicles, ... *B. laciniata.*

4. St. laurina, Wall. Cat. 1591; DC. Prod. IX. 13; Bth. in Linn. Proc. I. 102; Griff. Not. Dicot. 83.

Hab. Tenasserim, from Moulmein down to Mergui.—Fl. Aug.

Of *St. ovalifolia*, Wall. (Bth. l. c. 103) I have seen only Penang specimens with young inflorescences which may belong to the above. The panicles, however, are long-peduncled and axillary, and the tube seems very long and not bearded at the throat.

5. St. acuminata, Wall. Cat. 1593; DC. Prod. IX. 14.

Hab. Not unfrequent along the rocky sea-coasts of the Andamans; Tenasserim (Wall.).—Fl. Fr. April, May.

Willughbeia, Roxb.

Conspectus of Genera.

Inflorescence shortly peduncled; berry ovate, smooth, ... *W. edulis.*
Flower-clusters sessile or nearly so; berry globular, wrinkled, ... *W. Martabanica.*

1. W. edulis, Roxb. Corom. Pl. III. t. 280 and Fl. Ind. II. 57; DC. Prod. VIII. 321.

Hab. Chittagong.—Fl. Fr. nearly ∞.

2. W. Martabanica, Wall. Pl. As. Rar. III. 45. t. 272; DC. Prod. VIII. 321.

Hab. Martaban, Thoungyeen (Dr. Brandis); Upper Tenasserim, Moulmein (Wallich.).—Fr. April.

Allamanda, L.

*1. A. cathartica, L. Mant. 214; DC. Prod. VIII. 318.

Hab. Much cultivated in villages all over Burma, and in the Moulmein District apparently half-wild (Falconer).

Thevetia, L.

*1. Th. neriifolia, Juss. in Steud. Nomencl. cit.; DC. Prod. VIII. 343. (*Cerbera Thevetia*, L. sp. pl. 304; Bot. Mag. t. 2309).

Hab. Much cultivated in Burmese villages, especially in Prome.—Fl. March.

Carissa, L.

Conspectus of Species.

* * *All parts glabrous.*

Ovary-cells 4-ovuled; berries the size of a plum; leaves usually blunt or retuse, .. *C. carandas.*
Ovary-cells 2-ovuled; berries the size of a pea or somewhat larger; leaves usually acute, ... *C. diffusa.*

* * *All parts, especially while young, shortly and softly puberulous.*

Ovary-cells 2-ovuled; berries the size of a pea, ... *C. hirsuta.*

1. C. Carandas, L. Mant. 52; Roxb. Corom. Pl. I. 55. t. 77 and Fl. Ind. ed. Wall. II. 523; DC. Prod. VIII, 332; WA. in Comp. Bot. Mag. I. 276. t. 12; Wight Icon. t. 426; Bedd. Fl. Sylv. Madr. 156. t. 19. f. 6.

Var. β. congesta, Bedd. Man. For. Fl. Madr. I. 157 (*C. congesta*, Wight Icon. t. 1289), leaves almost orbicular; cymes short.

Var. γ. paucinervia, Bedd. l. c. (*C. paucinervia*, Wight Icon. t. 1290), leaves linear-lanceolate.

Hab. Var. α. Very frequent in the dry forests of the Prome District. Fl. March.

2. C. diffusa, Roxb. Fl. Ind. ed. Wall. II. 524; DC. Prod. VIII. 332; Wight Icon. t. 427.

Hab. Andamans, Termoklee island, along the rocky coast.—Fl. Fr. May.

3. C. hirsuta, Roth Nov. pl. sp. 128; DC. Prod. VIII. 333. (*C. villosa*, Roxb. Fl. Ind. ed. Wall. II. 525; Wight Icon. t. 437).

Hab. Ava, apparently frequent in the Irrawaddi valley.—Fr. Jan.

Winchia, A. DC.

Conspectus of Species.

Panicle glabrous, ... *W. calophylla*

Panicle minutely puberulous, ... *W. atroviridis.*

1. W. calophylla, DC. Prod. VIII. 326.; Deless. Icon. sel. V. t. 46.

Hab. Upper Tenasserim, Moulmein (Wall.).—Fl. March.

2. W. atroviridis, Kurz For. Fl. Burm. II. 170. (*Chilocarpus ? atroviridis*, Bl. Mus. Lugd. Bat. 153; *Hunteria ? atroviridis*, Wall. Cat. 1614; DC. Prod. VIII. 351).

Hab. Tenasserim, Tavoy (Gomez).

Probably not sufficiently distinct from the preceding species. *Hunteria cuspidata*, Wall. Cat. 1609 (DC. Prod. VIII. 351) without indication of locality seems to be a Malayan plant and is probably the same as *Melodinus orientalis*, Bl.

Rauwolfia, L.

1. R. serpentina, Bth. and Hf. Gen. pl. II. 697. (*Ophioxylon serpentinum*, Willd. sp. pl. IV. 979; Roxb. Fl. Ind. ed. Wall. II. 530; DC. Prod. VIII. 342; Wight Icon. t. 849).

Hab. Very frequent in the mixed and open, especially in the savannah forests, all over Burma from Chittagong and Ava down to Tenasserim. Fl. April, May.

Ochrosia, Juss.

1. O. SALUBRIS, Bl. Mus. Lugd. Bat. I. 158.—(*Cerbera oppositifolia*, Lamk. Enc. Bot. I. 62 ; DC. Prod. VIII. 354).

HAB. Rare in the tidal and beach-forests of the Andamans.—Fl. Fr. Febr., March.

Cerbera, L.

1. C. ODALLAM, Gærtn. Fruct. II. 193. t. 124 ; Roxb. Fl. Ind. ed. Wall. I. 692 ; DC. Prod. VIII. 313 ; Bot. Mag. t. 1845 ; Wight Icon. t. 441.

HAB. Not unfrequent in the littoral, chiefly the tidal, forests, from Chittagong down to Tenasserim and the Andamans.—Fl. March—May.

Calpicarpum, G. Don.

1. C. ROXBURGHII, G. Don. Gen. Syst. Dichl. IV. 100 ; Wight Icon. t. 431. (*Kopsia vincæflora*, Bl. Bydr. 1030 ; DC. Prod. VIII. 352 ; *Kopsia fruticosa*, DC. Prod. l. c. ; Bot. Mag. t. 4220 ; *Cerbera fruticosa*, Roxb. Fl. Ind. ed. Wall. I. 690).

HAB. Martaban, tropical forests, as in Yoonzeleen (Brandis); Tenasserim, Tavoy (Wall.) ; Rangoon (Cleghorn) ; generally planted in all Burmese villages.—Fl. Aug.—Decb.

Vinca, L.

*1. V. ROSEA, L. sp. pl. 305 ; Roxb. Fl. Ind. II. 1. ; Bot. Mag. t. 248 ; DC. Prod. VIII. 382. (*V. Guilelmi Waldemarii*, Klotzsch Bot. Ergebn. Prinz Waldemer. t. 70).

HAB. A South-American plant much cultivated in villages all over the country, and sometimes domesticated in rubbishy places.—Fl. Jan.—May.

Gynopogon, Forst. (1786).

(*Alyxia*, Banks.)

Conspectus of Species.

Corolla-tube nearly ½ in. long, ... *G. stellatum.*
Corolla-tube only about 2 lin. long, ... *G. breviflorum.*

1. G. STELLATUM, Lab. Sert. Austr. Caled. 30. t. 34.—(*Alyxia stellata*, Roem. and Schult. Syst. Veg. IV. 439 ; DC. Prod. VIII. 346 ; Miq. Fl. Ind. Bat. II. 407 ; Roxb. Fl. Ind. ed. Wall. II. 639 ; *Alyxia odorata*, Wall. Cat. 1606 ; DC. Prod. VIII. 347).

HAB. Along the rocky sea-coasts of Tenasserim and the Andamans. —Fl. April, May.

2. G. BREVIFLORUM, Kurz in For. Fl. Burm. 177.

HAB. In the tropical forests of Martaban, Yoonzeleen (Brandis) ; Upper Tenasserim, Taoo table-land, at about 2000 ft. elevation (Brandis).

Hunteria, Roxb.

1. H. LANCEOLATA, Wall. Cat. 1611; DC. Prod. VIII. 350. (*Gynopogon lanceolatum*, Kurz in For. Fl. Burm. II. 177.)

HAB. Tenasserim Tavoy (Wall.).

Unknown to me. Can it be the same as my *Gynopogon breviflorum?*

Tabernæmontana, Plum.

Conspectus of Species.

* *Bractlets persistent, conspicuous, longer than the pedicels.*

Corolla-tube longer than the tube; calyx-lobes 2—3 lin. long, linear-lanceolate, .. *T. recurva.*

Corolla-lobes half as long as the tube, ... *T. calycina.*

* * *Bracts and bractlets very deciduous and small, or persistent and minute.*

× Calyx-lobes acute or acuminate. Follicles tapering at the base but not stalked, without an appendage (usually cylindrical, with 6 longitudinal lines often raised.)

+ Cymes branched from the base and the branchings usually recurved or horizontal.

O Flowers large, showy, the corolla-lobes as long as the tube.

Corolla about an in. across, the lobes as long as the tube; all parts glabrous, .. *T. divaricata.*

O O Flowers small, the corolla-lobes only $\frac{1}{2}$—$\frac{1}{3}$ the length of the tube.

Glabrous; calyx-lobes acute; corolla-tube hardly $\frac{1}{2}$ in. long, ... *T. ophiorrhizoides.*

Glabrous, very like the preceding; calyx-lobes rather acute; corolla-tube nearly an inch long; follicles long-beaked, ... *T. rostrata.*

+ + Cymes brachiate, longer or shorter peduncled, more or less erect.

O Calyx-lobes broad, leafy, 3—4 lin. long.

Glabrous; corolla-lobes nearly as long as the tube, ... *T. alternifolia.*

O O Calyx-lobes narrow, small.

Glabrous, the cymes short-peduncled; calyx-lobes subulate-acuminate; corolla-tube slender, $\frac{3}{4}$ in. long, the lobes half as long or shorter; anthers inserted below the middle of the corolla-tube, ... *T. membranifolia.*

Glabrous, leaves exactly as in preceding; cymes long-peduncled; calyx-lobes said to be ovate, rather blunt, ... *T. graciliflora.*

Glabrous; peduncle 3 times as long as the 4—5 lin. long petioles; calyx-lobes ovate, acute, ... *T. microcarpa.*

× × Calyx-lobes rounded. Follicle long-stalked, with a coriaceous acuminate dorsal appendage.

Glabrous; cymes small, longer or shorter peduncled, ... *T. subcapitata.*

1. T. RECURVA, Roxb. Hort. Bengh. 20 and Fl. Ind. II. 26; Wight Icon. t. 476; DC. Prod. VIII. 371.—(*T. gratissima*, Ldl. Bot. Reg. t. 1084).

HAB. Frequent in the tropical forests of the southern spurs of the Pegu Yomah above Rangoon; also in Upper Tenasserim and Chittagong, apparently always in the neighbourhood of tidal streams.—Fl. May, June.

2. T. CALYCINA, Wall. Bot. Reg. in adn. ad t. 1273 and Cat. 1577; DC. Prod. VIII. 372.

HAB. Tenasserim, Tavoy (Wall.).

Not seen by me, and probably same as preceding.

3. T. DIVARICATA, Bl. Bydr. 1027, non Don. (*Nerium divaricatum*, L. sp. pl. 306; *T. coronaria*, R. Br. Hort. Kew. II. 72; DC. Prod. VIII. 373; Roxb. Fl. Ind. II. 23; Wight Icon. t. 477).

HAB. Generally planted in villages all over Burma and the adjacent islands.—Fl. Oct.—Dec.

4. T. OPHIORRHIZOIDES, Kurz in Journ. As. Soc. Beng. 1873. 89.

HAB. Frequent in the hill-forests of Martaban, at 3000 to 5000 ft. elevation.—Fl. April.

5. T. ROSTRATA, Wall. in Bot. Reg. adnot. ad. t. 1273 and Cat. 1578; DC. Prod. VIII. 371.

HAB. Ava, Irrawaddi valley, at Segain (Wall.).—Fl. Fr. Nov.

I have seen only fruiting specimens, which in foliage quite agree with the preceding species (which is a hill-species).

6. T. ALTERNIFOLIA, L. sp. pl. 308; Roxb. Fl. Ind. II. 24. (*T. crispa*, Roxb. Hort. Beng. 20 and Fl. Ind. II. 24; Wight Icon. t. 470; DC. Prod. VIII. 371).

HAB. Frequent in the beach-forests, and along the coasts generally, of the Andamans.—Fl. Febr.—May; Fr March, April.

7. T. MEMBRANIFOLIA, Kurz in Journ. As. Soc. Beng. 1873. 90.

HAB. In the tropical forests of Toukyeghat, east of Tounghoo.—Fl. April, May.

I fear referable to the following species, of which I have now seen only a very imperfect specimen. The leaves are the same in both.

8. T. GRACILIFLORA, Wall. in Bot. Reg. adnot. ad. t. 1273 and Cat. 1576; DC. Prod. VIII. 372.

HAB. Tenasserim, Amherst (Wall.).

9. T. MICROCARPA, Wall. in Bot. Reg. adnot. ad. t. 1273 and Cat. 1581.; DC. Prod. VIII. 372.

HAB. Ava, Taong-dong (Wall.).

Unknown to me.

10. T. SUBCAPITATA, Wall. Cat. 1579; DC. Prod. VIII. 373.

HAB. Pegu (more probably Martaban) (Dr. Brandis); Tenasserim, Tavoy (Wall.).—Fl. Dec.

Plumieria, Tournef.

*1. P. ACUTIFOLIA, Poir. Suppl. II. 667; DC. Prod. VIII. 392. —(*P. acuminata*, Ait. Hort. Kew ed. alt. I. 70; Roxb. Fl. Ind. II. 20; Bot. Mag. t. 3952; Wight Icon. t. 471).

HAB. Very frequently planted in Burmese villages.—Fl. March, April.

Alstonia, R. Br.

Conspectus of Species.

Inflorescence densely pubescent, ... *A. scholaris.*
Peduncles glabrous, the calyx and pedicels minutely puberulous, ... *A. spectabilis.*

1. A. SCHOLARIS, R. Br. in Mem. Wern. Soc. I. 76; DC. Prod. VIII. 409; Wight Icon. t. 422 (mala); Bedd. Sylv. Madr. t. 242.

HAB. Not unfrequent in the leaf-shedding, especially the open and dry, forests, from Prome and Martaban down to Tenasserim; also Chittagong.—Fl. Oct.—Sept.

2. A. SPECTABILIS, R. Br. in Mem. Wern. Soc. I. 76; DC. Prod. VIII. 409.

HAB. Coast-forests of the Andamans.

Hardly specifically different from the preceding species.

Beaumontia, Wall.

1. B. GRANDIFLORA, Wall. Tent. Fl. Napal. 15. t. 7; Bot. Reg. t. 911; Bot. Mag. t. 3213; DC. Prod. VIII. 403.—(*Echites grandiflora*, Roxb. Fl. Ind. II. 14, non Roth).

HAB. Chittagong hills.—Fl. DS.

Vallaris, Burm.

1. V HEYNEI, Spreng. Syst. veg. I. 635; Dalz. and Gibson Bomb. For. 144 (*V dichotoma*, Wall. Cat. 1621; Wight Icon. t. 438; DC. Prod. VIII. 400; *Echites dichotoma*, Roxb. Fl. Ind. II. 19; *Peltandra solanacea*, Roth. nov. sp. 132).

Var. α. GLABRA, all parts glabrous.

Var. β. PUBESCENS, all the softer parts puberulous, the leaves (adult) minutely rough-puberulous beneath.

HAB. Frequent in the dry, especially the mixed dry, forests of the Prome District.—Fl. Fr. March.

Doubtful Species.

1. *V. ? anceps*, Wall. Cat. 1622; DC. Prod. VIII. 400 (nomen nudum).

HAB. Tenasserim, Tavoy (Wall.).

I have only seen leaves, which seem hardly referable to *Apocynaceæ.*

Parsonsia, R. Br.

1. P. SPIRALIS, R. Br. in Wall. Cat. 1631; DC. Prod. VIII. 402. (*Heligme Javanica*, Bl. Bydr. 1043; DC. Prod. VIII. 425; *P. oblonga*,

Wall. Cat. 1632; DC. Prod. VIII. 402; *Heligme Rheedii,* Wight Icon. t. 1303?; *Spirostemon spiralis,* Griff. Not. Dicot. 80. t?· 411 f. 1)

HAB. Pegu, above Rangoon; Upper Tenasserim, Moulmein (Wall.),—Fl. April.

Pottsia, Hook. and Arn.

1. P. CANTONIENSIS, Hook. and Arn. Bot. Voy. Beech. 198. t. 43; Miq. Fl. Ind. Bat. II. 450 (*Euthodon paniculatus,* Griff. Not. Dicot. 48· t. 458. f. 2.)

HAB. Tenasserim, Mergui (Griff.).

Urceola, Roxb.

1. U. LUCIDA, Bth. and Hf. Gen. pl. II. 716 (*Chavannesia lucida,* DC. Prod. VIII. 444; *Chavannesia esculenta,,* DC. Prod. l. c.; *Urceola esculenta,* Bth. in Kurz For. Fl. Burm. II. 184).

HAB. Common all over Pegu (*teste* G. W. Strettell); Tenasserim (Wall.).

Parameria, Bth.

1. P. GLANDULIFERA, Bth. and Hf. Gen. Pl. II. 715. (*Ecdysanthera glandulifera,* DC. Prod. VIII. 443; Wight Icon. t. 1307; *E. Griffithii* Wight in text pedicellis et calyce pubescente; Miq. Fl. Ind. Bat. II. 452; *Ecdysanthera barbata,* Miq. Fl. Ind. Bat. II. 451).

HAB. Not unfrequent along the borders of the tidal forests of the coast of the Andamans; also Tenasserim.—Fr. March, April.

Ecdysanthera, Hook. and Arn.

1. E. BRACHIATA, DC. Prod. VIII. 443.

HAB. Ava; Khakyen hills (J. Anderson).—Fl. RS.

Anodendron, A. DC.

1. A. PANICULATUM, A. DC. Prod. VIII. 442. (*Echites paniculata,* Roxb. Fl. Ind. II. 17; Wight Icon. t. 396).

HAB. Not unfrequent in the tropical forests of the Pegu Yomah, Martaban, and Tenasserim, especially along choungs.—Fl. Jan., Febr.; Fr. the following year.

Cercocoma, Miq. non Don.

(*Rhynchodia,* Bth.).

1. C. WALLICHII, Miq. Fl. Ind. Bat. II. 445. (*Echites rhyncosperma,* Wall. Pl. As. rar. I. 43. t. 49; *Rhyncosperma Wallichii,* DC. Prod. VIII. 431).

Hab. Not unfrequent in the tropical forests of Martaban down to Tenasserim, rare along the eastern slopes of the Pegu Yomah; also Ava (Mrs. Burney).—Fl. April.

Ichnocarpus, R. Br.

1. I. FRUTESCENS, R. Br. Hort. Kew. ed. 2. 69; DC. Prod. VIII. 435; Wight Icon. t. 430. (*Echites frutescens*, Roxb. Fl. Ind. II. 12).

Var. *α*. GENUINA, leaves and follicles glabrous.

Var. *β*. PUBESCENS, leaves beneath (while young on both sides) and the young follicles appressed rusty-pubescent.

Hab. Frequent in the leaf-shedding, especially the mixed and savannah-, forests all over Burma; var. *β*. chiefly in the dry forests of Ava and Prome.—Fl. CS.; Fr. HS.

Aganosma, G. Don.

Conspectus of Species.

Calyx-lobes nearly an inch long, tawny-velvety; nerves of leaves impressed, .. *A. calycina.*
Calyx-lobes only 2—3 lin. long, glabrous; nerves of leaves prominent beneath and uniting towards the margin, ... *A. marginata.*

1. A. CALYCINA, DC. Prod. VIII. 432. (*A. Wallichii*, Don Gen. Syst. IV. 77.)

Hab. Tenasserim, Tavoy (Gomez).—Fl. Sept.

2. A. MARGINATA, G. Don. Gen. Syst. IV. 77; DC. Prod. VIII. 433; Wight Icon. t. 425. (*Echites marginata*, Roxb. Fl. Ind. II, 15; *A. macrocarpa*, DC. Prod. VIII. 434).

Hab. Frequent in the open and lower mixed forests from Ava and Martaban down to Tenasserim; also Chittagong.—Fl. March, April; Fr. the next year.

Epigynum, Wight.

1. E. GRIFFITHIANUM, Wight Icon. t. 1308; Walp. Ann III. 42.

Hab. Tenasserim, Mergui (Griff.).

Holarrhena, R. Br.

1. H. ANTIDYSENTERICA, Wall. Cat. 1672; DC. Prod. VIII. 413; Brand. For. Fl. 326. t. 40.—(*Chonemorpha antidysenterica*, G. Don Gen. Syst. Gard. IV. 79; Wight Icon. t. 439).

Var. *α*. GENUINA, all parts (also the inflorescence) glabrous.

Var. *β*. CODAGA (*H. Codaga*, G. Don Gen. Syst. Gard. IV. 78; DC. Prod. VIII. 414; Wight Icon. t. 1297; *H. pubescens*, Wall. Cat. 1673; DC. Prod. VIII. 413), all parts (also the inflorescence) shortly velvety pubescent.

Hab. Not unfrequent in the dry and open forests, all over Burma, from Chittagong and Ava down to Tenasserim; var. *β*. chiefly in the drier upper mixed forests.—Fl. March, April; Fr. CS.

Chonemorpha, G. Don.

(*Epichysianthus*, Voigt.)

1. CH. MÆROPHYLLA, G. Don Gen. Syst. IV. 76; DC. Prod. VIII. 430; Wight Icon. t. 432.—(*Echites macrophylla*, Roxb. Fl. Ind. II. 13; *Ch. mollis*, Miq. Fl. Ind. Bat. II. 444).

HAB. Frequent in the tropical forests of the Andamans, especially along choungs.—Fl. May.

Nerium, L.

1. N. ODORUM, Sol. Hort. Kew. ed. 1. I. 297; Roxb. Fl. Ind. II. 2; Bot. Mag. t. 2032; DC. Prod. VIII. 420.

HAB. Often cultivated in villages, especially around monasteries, all over Burma.

Strophanthus, DC.

Conspectus of Species.

* *Corolla-lobes acute or acuminate, but not produced into long tails.*

Floral bracts ovate, acute, stiff, only $1\frac{1}{2}$ lin. long, ... *St. brevicaudatus.*

* * *Corolla-lobes produced into tails 2 or more inches long.*

× Floral bracts and the conform calyx-lobes stiff, linear-subulate.

Corolla (without the tails) about an inch long, ... *St. Griffithii.*

Corolla (without the tails) about $\frac{1}{2}$ in. long, ... *St. longicaudatus.*

× × Floral bracts and the conform calyx-lobes flaccid, reflexed, linear.

Corolla about $\frac{2}{3}$ in. long; bristles twice as long as the anthers, ... *S. caudatus.*

1. ST. BREVICAUDATUS, Wight Icon. t. 1302.

HAB. Doubtful, probably Mergui, Tenasserim (Griff.).

N. B. The Griffithian specimens of this species in H. BC. are from Malacca.

2. ST. GRIFFITHII, Wight Icon. t. 1300; Miq. Fl. Ind. Bat. II. 442.—(*St. pentaphyllus*, Griff. Not. Dicot. 78; *St. Horsfieldianus*, Miq. Fl. Ind. Bat. II. 442).

HAB. Upper Tenasserim, Moulmein (Falconer).

3. ST. LONGICAUDATUS, Wight Icon. t. 1299; Miq. in Fl. Ind. Bat. II. 442.

HAB. South Tenasserim.

4. ST. CAUDATUS, (*Echites caudata*, Burm. Fl. Ind. 68, t. 26; *St. dichotomus*, DC. in Bull. Soc. Philom. III. 123 and Prod. VIII. 407; *Nerium caudatum*, Roxb. Fl. Ind. II. 9).

HAB. Tenasserim, from Moulmein down to Tavoy (Rev. Parish, Falconer).—Fl. Jan.

Wrightia, R. Br.

Conspectus of Species.

* *Throat of corolla furnished with scales or fringes.*

× Corolla-throat fringed with a ring of branched long filiform scales.

All parts glabrous; corolla white, the lobes linear-oblong................ *W. tinctoria.*

× × Scales of corolla-throat thick and fleshy, entire or lobed.

All parts especially the leaves, shortly and densely pubescent; corolla-lobes broad, the scales of the throat cuneate, 2—3-lobulate,....................... *W. mollissima.*

All parts glabrous; corolla red, the lobes broad, the scales large, rounded, obsoletely crenate,.. *W. coccinea.*

* * *Corolla-throat quite naked.*

Glabrous, the leaves small and narrow; pedicels filiform; corolla small, white, .. *W. religiosa.*

1. W. TINCTORIA, R. Br. in Mem. Wern. Soc. I. 73; Wight Icon. t. 444; Bot. Reg. t. 933; DC. Prod. VIII. 406; Bedd. Sylv. Madr. t. 241 (*Nerium tinctorium*, Roxb. Fl. Ind. II. 4).

HAB. Burmah (according to Rev. F. Mason), probably Ava?

2. W. MOLLISSIMA, Wall. Cat. 1627 and Pl. As. rar. II. t. 146; DC. Prod. VIII. 405. (*W. Wallichii*, DC. Prod. VIII. 405; Dalz. and Gibs. Bomb. Fl. 145?).

HAB. Common in the lower and upper mixed forests, from Chittagong and Ava down to Tenasserim, up to 2000 ft. elevation.—Fl. April, May; Fr. CS.

3. W. COCCINEA, Sims. Bot. Mag. t. 2696; Bot. Cab. t. 894; Wight Icon. t. 442; DC. Prod. VIII. 407. (*Nerium coccineum*, Roxb. Fl. Ind. II. 2).

HAB. Chittagong hills.

4. W. RELIGIOSA, Bth. Gen. pl. II. 713. (*Echites religiosa*, Teysm. and Binn. in Nat. Tydsch. Ned. Ind. XXV. 48).

HAB. Tenasserim and the adjoining Siamese provinces.—Fl. Fr. HS.

CONTENTS

OF THE NATURAL HISTORY PART (PT. II.) OF THE

JOURNAL OF THE ASIATIC SOCIETY OF BENGAL FOR 1876.

No. 1, (issued June 26th, 1876). *On the General Theory of Duplex Telegraphy* (with a Woodcut).—*By* LOUIS SCHWENDLER.—*On some Lizards from Sind, with Descriptions of new Species of* Ptyodactylus, Stenodactylus, *and* Trapelus (Pls. I and II).—*By* W. T. BLANFORD.—*On certain protracted Irregularities of Atmospheric Pressure in the Indian Monsoon region, and their Relation to Variations of the local Rainfall.*—*By* H. F. BLANFORD.—*Description of a new Species of* Phasmidæ (Pl. XI).—*By* J. WOOD-MASON.—*Description of* Felis Shawiana, *a new Lyncine Cat from Eastern Turkestan.*—*By* W. T. BLANFORD.—*Description of a new Species of* Cetoniidæ.—*By* J. WOOD-MASON.

No. 2, (issued August 18th, 1876). *An Account of Experiments made in* 1875 *and* 1876 *in various parts of India, for the purpose of comparing the observed Temperature of the Dew-point with that computed from the Psychrometer by different methods of Reduction.*—*By* H. F. BLANFORD.—*List of the Birds collected on the Expedition into the Dafla Hills, Assam, together with those obtained in the adjacent Darrang Terai* (Pls. III and IV).—*By* H. H. GODWIN-AUSTEN.—*On the Physical Geography of the Great Indian Desert with especial reference to the former Existence of the Sea in the Indus Valley; and on the Origin and Mode of Formation of the Sand-hills.*—*By* W. T. BLANFORD.

No. 3, (issued November 14th, 1876). *A Sketch of the Vegetation of the Nicobar Islands* (Pls. XII and XIII).—*By* S. KURZ.—*Description of* Golunda Ellioti *from Sind* (Pl. X).—*By* W. T. BLANFORD.—*On the* Cyclostomacea *of the Dafla Hills, Assam* (Pls. VII and VIII, A).—*By* H. H. GODWIN-AUSTEN.—*Descriptions of some new Land and Fresh-Water Shells from India and Burmah* (Pl. XIV).—*By* W. THEOBALD.—*Description of new Species of* Blattidæ *belonging to the Genus* Panesthia.—*By* J. WOOD-MASON.

No. 4, (issued April 19th, 1877). *Fifth List of Birds from the Hill Ranges of the North-East Frontier of India* (Pls. V, VI, and IX).—*By* H. H. GODWIN-AUSTEN.—*Contributions towards a Knowledge of the Burmese Flora.*—*By* S. KURZ.—*On the* Helicidæ *collected during the Expedition into the Dafla Hills, Assam* (Pl. VIII).—*By* H. H. GODWIN-AUSTEN.—*On the Physical Explanation of the Inequality of the two Semi-diurnal Oscillations of Barometric Pressure.*—*By* H. F. BLANFORD.—*Contributions towards the knowledge of the Fossil Flora in India. I. On some Fossil Plants from the Damuda Series in the Raniganj Coalfield, collected by* MR. J. WOOD-MASON (Pls. XV—XXI).—*By* OTTOKAR FEISTMANTEL.

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THE NATURAL HISTORY SECRETARY.

MUSEUM ASIATIC SOCIETY CALCUTTA

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CONTENTS.

Page

VII.—*On an apparently undescribed Weasel from Yarkand.—By* W. T. Blanford, F. R. S., &c., ... 259

VIII.—*Description of some new and little known Asiatic Shrews in the Indian Museum, Calcutta.—By* John Anderson, M. D., *Superintendent*, ... 261

IX.—*Notes on the Mammalian Fauna of the Wardwán and Upper Chináb Valleys.—By* R. Lydekker, B. A., *Geological Survey of India*, ... 283

X.—*On the Metád Rat* (Golunda Meltada, *Gray) with a note on* Golunda Ellioti.—*By* W. T. Blanford, F. R. S., &c., (with Plate I.), ... 288

XI.—*Record of the Occurrence of Earthquakes in Assam during the years* 1874, 1875, 1876. *Communicated by* Col. R. H. Keatinge, C. S. I., V. C., *Chief Commissioner*, ... 294

XII.—*Notes on a collection of Chiroptera from India and Burma, with description of new species.—By* G. E. Dobson, M. A., M. B., F. L. S., &c., ... 310

XIII.—*Description of* Spiraculum Mastersi.—*By* W. T. Blanford, F. R. S., &c., ... 313

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL..

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Part II.—PHYSICAL SCIENCE.

No. III.—1877.

VII.—*On an apparently undescribed Weasel from Yarkand.*—*By* W. T. Blanford, F. R. S., &c.

Amongst the collections brought by Dr. Stoliczka from Eastern Turkestan was the skin of a weasel which had been kept in confinement. Judging from the skin alone, the animal appeared chiefly to differ from the common European weasel in colour, and it was difficult to say how far this difference was due to the circumstances under which the individual had been kept. Although I strongly suspected that it was a distinct species, still I thought it safer not to form conclusions from a single skin, and in the list of species J. A. S. B., 1875, Vol. XLIV, Pt. 2, p. 106, I noted the specimen as *Mustela vulgaris ?* var.

A year later Dr. Scully brought from Turkestan another skin of the same weasel, but the second specimen had belonged to a male wild individual. This skin was also entrusted to me together with some other interesting specimens for description, and I regret that other work has prevented my noticing it sooner. On comparing this second specimen more carefully with *M. vulgaris*, I found that it differed not only in colour, but in size, being a much larger animal. The length measured on the fresh carcase by Dr. Scully, shews that the Yarkand weasel is nearly as large as an ermine, whilst the tail, the vertebræ of which are for the most part preserved, appears to be proportionally longer than in the common weasel. The weight and some other details are also carefully recorded on the label. The name in Eastern Turkestan is *Agha makan.*

The following is a description :—

MUSTELA STOLICZKANA, sp. nov.

Mustela ad M. vulgarem proxime accedens sed valde major, superne fusco-arenaria, subtus albida, caudâ longiore, quartem partem totius longitudinis subæquante, cum dorso concolore ; labris ambobus genisque inferioribus albis, maculâ utrinque post angulam oris fulvâ, alterâque ante oculum utrumque albâ, palmis plantisque confertim pilis indutis. Long. tota cum caudâ 12·2, *caudæ, pilis inclusis,* 3, *cranii* 1·8, *pedis posterioris a calcaneo* 1·4 *poll. Angl.*

HAB. Yarkand (Stoliczka, Scully).

Colour pale sandy brown above, the hairs rather paler and whitish at the base, white below. Fur short, dense and soft. Tail throughout the same colour as the back. There is a small white spot close to the anterior angle of each eye, and a rather larger sandy brown spot a little behind the gape in the lower part of the cheeks which are white to within a short distance below the eye. Upper lip white. Upper whiskers dark brown towards the base, and of about the same length as the head. Fore feet white mixed with pale brown above, hind feet only whitish at the edges; soles of all the feet thickly clad, only the toe pads being naked, and even they are almost concealed by the long hair. Tail nearly cylindrical, about one-third the length of the head and body.

The whole length, measured by Dr. Scully when the animal was fresh, and noted on the ticket, was 12·2 inches, the tail, of which the vertebræ are preserved, now measures 3 inches including the hair at the end, or 2·3 without it. The hind foot and tarsus are 1·4 inches long without the claws. Fur on the back about 0·3 in. long. The weight marked by Dr. Scully on the label was 5·2 oz.*

The skull is slightly imperfect behind, the occipital plane having been cut away, but as the occipital crest remains, the total length can be measured with close approximation. The cranium shews the specimen to have been just adult, the dentition being perfect, although the sagittal crest is only rudimentary. The following are the dimensions:

	in.	metre.
Length of skull (approximate) from occipital plane to alveolar margin,	1·75	·0425
Breadth of brain case across parietal region,	0·83	·021
Ditto across zygomatic arches,	0·98	·024
Ditto behind post-orbital processes,	0·4	·01
Length of suture between nasal bones,	0·28	·077

---

* The weight of the common weasel, according to Pallas, Zoog. Ros. As. I. p. 98, is only 2 ounces and a drachm in the largest individuals, 1½ oz. in smaller animals, chiefly females.

Length of bony palate from anterior alveolar margin to the opening of the posterior nares,	0·75	·0185
Length of carnassial tooth along outer edge,	0·2	·005
Breadth of tubercular (hinder) molar,	0·15	·0938
Breadth of bony palate between hinder molars,	0·3	·0075
Length of lower jaw from condyle to symphysis,	1·	·025
Height of ditto from the coronoid process,	0·5	·0125

VIII.—*Description of some new and little known Asiatic Shrews in the Indian Museum, Calcutta.*—*By* John Anderson, M. D., *Superintendent.*

In preparing a Catalogue of the Mammals in the Indian Museum, it has been necessary to examine in detail the now somewhat extensive collection of shrews which has been formed since the Asiatic Society's collections were practically transferred to the Government of India, nearly eleven years ago.

To show the progress which has been made since 1866, in a department which has never attracted many cultivators, it may suffice to state that Blyth's Catalogue of Mammals which was published in 1863 contained only 15 species of Asiatic Shrews. These were represented in the Asiatic Society's Museum, in 1865, by 22 mounted and 18 alcoholic specimens, and by 5 skulls and 2 skeletons.

At present, there are 38 species of these small Mammals in the Indian Museum, illustrated by nearly 130 alcoholic specimens, 29 dried skins, 71 skulls and 5 skeletons.

The most important additions to the Indian Museum in this section of the vertebrates, since the publication of Blyth's Catalogue, have been *Anurosorex*, and the water-shrew of the Himalayas, the so-called *Crossopus himalaicus.*

The discovery of the former, remarkable, generic type in Assam was made by Mr. S. E. Peal of Sibságar, in 1871, about one year after it had been described by M. A. Milne-Edwards from a specimen obtained in Sé-tchouan and Tibet by the distinguished traveller, M. l'Abbé David.

The first specimen of the Himalayan water-shrew in the Indian Museum was obtained by the late Dr. Jerdon in Sikkim, and the second example was procured by myself to the east of Bhamô, in the Kakhyen hills which form the natural western boundary of the Chinese Province of Yunnan. It has been again obtained by Mr. Mandelli of Dárjíling who has done so much to extend our knowledge regarding the fauna of Sikkim. No information that

I am aware of, is on record regarding the localities and heights at which this water-shrew has been found in the Himalaya, but judging by the elevation at which it occurs in the Kakhyen hills which are essentially Himalayan in their fauna, this most interesting shrew most probably lives at elevations of 3000 up to 5000 feet, or perhaps even higher.

It is very closely allied to the aquatic shrew of Japan named *Sorex platycephalus*, Temminck, but apparently differs from it specifically.

By its general structure, it appears to be more nearly allied to *Nectogale* than to *Crossopus* from which it is generically separated by the character of its teeth, leaving out of view other and more important considerations such as its long, attenuated body, and the much stronger ciliation of its feet and tail, in all of which characters, as in those of its skull and teeth, it evinces a closer relationship to *Nectogale* than to any other known genus of shrew. It is, however, less aquatic in its habits than *Nectogale*, as is proved by its hind feet not being webbed as in that genus, but there can be no doubt of the close generic relationship of *Nectogale* with the Himalayan water-shrew. The structural features, however, of the latter and of the Japan shrew are such that they cannot be referred to any existing genus of mammalia, and I therefore propose the following genus for their reception.

CHIMARROGALE, n. g.

Teeth white $\frac{2 \times 4}{2} \times \frac{2}{2} \times \frac{8}{2 \times 6} = 28$. Front upper incisors with a small talon on their inner side. Three intermediate teeth of nearly equal size; feet and toes scaly, ciliated with short coarse rigid hairs along their external and internal margins. Toes not webbed. Tail long, scaly, quadrangular, covered with longish, coarse, adpressed hairs. Snout elongate: ears almost wholly hidden, valvular.

The more immediate object, however, of this paper is to describe a number of shrews which appear to be new to science and to indicate a few others which have hitherto been seemingly wrongly determined.

They belong to the genera *Crocidura* and *Soriculus*. A large number of the species belonging to *Pachyura*, the sub-division of the first-named genus distinguished by 30 white teeth, are possessed of a series of cuticular aggregated glands on the side of the trunk, emitting a strong musky odour, whilst a few of the same sub-division are devoid of these structures; whereas the majority of the shrews belonging to the second sub-division of Crocidura with 28 white teeth, are devoid of musk glands on the side, and are thus inodorous. Some very small shrews, such as *C.* (*P.*) *macrotis* and *C.* (*P.*) *nitidofulva*, have musk glands, like their larger compeers, while others of the very same, sub-generic division want them, *e. g. C.* (*P.*) *pygmæoides*.

In estimating the age of individuals, I have always been guided by the condition of the bones of the skull, and I have judged those adult in which the basi-occipital and basi-sphenoid bones have been united. This is the last suture to disappear, and its obliteration in shrews is the only reliable test of full maturity. In skulls, however, with this suture entirely lost, the teeth very frequently do not present any marked indications of wear, so that union takes place before the animals are aged.

In all the newly born shrews that I have examined, the teeth have never been through the gum, but they have always been so well developed that the position, and in some cases the form, of each tooth was clearly defined.

Genus CROCIDURA, Wagler.

Sub-Genus PACHYURA, *Selys.*

(Lateral gland.)

CROCIDURA, (P.) FULVOCINEREA, n. s.

Form of the body as in *C. (P.) gigantea.*

The snout is long and pointed; feet well developed and moderately haired. Tail swollen at the base and rather long and densely haired. Snout and feet yellowish, and lower portion of limbs with short sparse hairs, as usual. Claws long and pointed. Fur dark-slaty in the hidden portion, but broadly tipped with pale fawn producing a brownish-gray mixed with tawny resembling the colour of *Lepus cuniculus*, but with a distinct rusty tinge on the head. Under parts more grayish brown, with a little tawny. Whiskers nearly all white, or pale gray. Hairs on the feet and tail pale yellowish-brown or nearly white, the short tail hairs being rather longer and much more numerous than is generally the case in the allied species, and those at the tip occasionally longer.

	Adult ♂	Adolescent ♀
Length, tip of snout to vent,	in. 6·07	in. 4·35
Vent to tip of tail,	3·90	2·83
Length of hind foot without claws,	1·00	0·82
Tip of snout to eye,	1·00	0·70
Eye to ear,	0·57	0·35
Height of ear,	0·50	0·35
Breadth of ear,	0·41	0·40

The first upper incisors are not very long; their posterior process is on a level with the third incisor and canine, and their longitudinal breadth about equals the breadth of the base of the dependent portion of the teeth. There is a small internal process of the cingulum. The second incisor is not very large and is hardly twice the size of the third incisor. This last mentioned tooth and the canine are of equal size and their tips are nearly on the same level. The premolar is very small and lies behind the canine and slightly internal to the first molar, so that only half of it is externally visible. It is very small and its tip reaches only a short way below the cingulum of the canine. The cusp on the anterior, external angle of the first molar is well developed and its point is on a level with the point of the canine in some, and below it in others. The chief cusp of this molar is not prominent.

	♂	♀
Anterior border of foramen magnum to tip of premaxillæ,	in. 1·35	in. 1·15
Greatest breadth across maxilla, ...	0·50	0·41
Breadth at posterior border of infraorbital foramen, ...	0·28	0·25
,, anterior to brain case, ...	0·33	0·30
,, external to glenoid fossæ, ...	0·53	0·45
,, ,, to tympanic, ...	0·66	0·58
Length of upper alveolar line, ...	0·65	0·54
From condyle of lower jaw to end of alveolar line,............	0·85	0·70

The skull is distinguished from the skull of *C. blythii* by its greater size and much larger teeth. The first upper incisors are stronger and the second incisor relatively smaller than in that species: on the other hand, the skull, as is shown by the measurements given of a perfectly adult ♂, is considerably smaller than the skull of *C. gigantea*, and the teeth are proportionally less.

This species, in its proportions, appears to be closely allied to *C. tytleri*, from Dehra Dún, but the characters of the latter have been so vaguely defined that it is impossible to decide whether the two are identical or not. Blyth does not give any information about the teeth. It is also distinguished from *C. gigantea* by its more profuse and fawn-coloured fur and by its well-haired tail, and from *C. blythii* by its larger size, by its dentition and by its pale fur.

It inhabits the valley of Assam (Gauháti).

CROCIDURA (P.) BLYTHII, Andr.

Sorex murinus, Blyth, Journ. As. Soc., Bengal, Vol. XXIV, 1855, p. 28, in part.

Sorex cærulescens, Tomes, Ann. and Mag. Nat. Hist., Vol. XVII, 1856, p. 16.

Sorex Griffithii, Blyth, As. Soc.'s Mus. 1863, p. 83, No. 247.

Pachyura Griffithii, Andr., Proc. Zoo. Soc., 1873, p. 231.

Snout narrow, long and pointed. Ears rather flattened above, rounded posteriorly and of moderate size. Feet only moderately large. Fore limb with long hairs to the wrist, longer than those on the corresponding portion of the hind limb. Feet covered with short brown hairs, a few longer, overhanging the claws. Claws strong, but short. Snout, ears, feet and tail brownish. Tail thickened at the base, rounded, ringed and rather thickly clad with brown hairs, with a few longer whitish hairs intermixed, and nearly equalling the length of the trunk without the head. Fur soft, rather long: a rich rusty brown, with a golden sheen in certain lights. Under surface rusty gray. Some are darker than others.

	Adolescent ♂	Adult ♀
Length, tip of snout to vent,	in. 4·72	in. 5·00
„ vent to tip of tail,	2·80	2·50
„ of hind foot without claws,	0·83	0·75
„ from tip of snout to eye,	0 75	0·75
„ „ eye to ear,	0·42	0·40
Height of ear,	0·32	0·34
Breadth of ear,	0·42	0·36

These measurements would seem to indicate that the males have rather longer tails than the females, but the specimens at my disposal are not sufficiently numerous to permit of this point being settled, but there can be no doubt of the specific identity of the specimens which yield these results.

The skull of the type appears to be that of a male, not fully mature, as its basi-occipital suture is still unclosed. The posterior process of the first upper incisor is moderately developed and there is only a very obscure process on its inner side. It is not so broad as the base of the front portion of the tooth. The second incisor is large, and broader than the conjoint third incisor and canine, but its tip is above the level of the point of the central cusp of the first molar. The canine is considerably larger than the third incisor, and its point is below the level of the anterior cusp of the first molar.

There appears to be a considerable difference between the size of the sexes, as indicated not only by the body measurements but by their skulls. The skulls also indicate that the species is smaller than *C. fulvocinerea*, because its skull although not very much older than the skulls of which the measurements are given below exceeds them in size. Comparing the skulls of these two species, the first upper incisors of *C. fulvocinerea* are seen to be larger than in *C. blythii*, whereas the second upper incisor of the latter is considerably larger than the corresponding incisor of *C. fulvocinerea*, and its canine is more pointed and larger than the third incisor. The premolar of *C. blythii* is relatively larger than the premolar of *C. fulvocinerea* and it has a small cusp-like process of the cingulum on its outer side, which is partially visible externally.

	Adolescent ♂	Adult ♀
Anterior border of foramen magnum to tip of premaxillæ,	in. 1·20	in. 1·13
Greatest breadth across maxillæ,	0·44	0·45
Breadth behind infraorbital foramen,	0·27	0·26
Breadth anterior to brain case,	0·28	0·30
„ external to glenoid fossæ,	0·50	0·45
„ „ to tympanic,	0·54	0·55
Length of upper alveolar line,	0·58	0·55
Length from condyle of lower jaw to end of alveolar margin,	0·70	0·68

Tomes describes the type of *S. griffithii* as characterized by the large size of its teeth which exceeded, he states, those of any example of *S. cærulescens* he had ever seen. Such a description however is in no way applicable to the types of *S. griffithii* as understood by Blyth, and it is therefore perfectly evident, apart from external characters, that they are not the *S. griffithii* of Horsfield. Tomes, however, did not concur with Horsfield in considering the fur as either short close or soft, but describes it as of medium length, deep blackish gray, glossy and rather coarse. The specimens from Arakan described by Blyth as *S. murinus* (Ann. and Mag. Nat. Hist., Vol. XVII, 1851, p. 15) were afterwards the types of Blyth's *S. griffithii*, but these specimens were regarded by Tomes as *S. cærulescens*.

Blyth was under the impression that the type of *S. griffithii* was from the Khásia hills, although described from Afghanistan, because he saw a fine skin of a shrew he believed to be *S. griffithii* from Chárápúnjí in the possession of Griffith. This specimen had been forwarded to the India House by Dr. M'Clelland, and Blyth seems to have concluded that it was the type of *S. griffithii*, Horsfield. But the evidence is unsatisfactory. And, moreover, Blyth's specimens do not agree with the description of *S. griffithii.*

It inhabits the hilly region of Assam, (Sibságar), the Khásia Hills (Chárápúnjí) and Arakan.

Crocidura (P.) sindensis, n. s.

Snout moderately long, and pointed; ears full and rounded, sparsely clad, the margins and flaps with longish, somewhat stiff hairs. Lower half of limbs seminude; feet slender and toes rather long. Tail rounded, slightly swollen at the base and about four-fifth the length of the trunk. Fur moderately long soft and glossy; neutral gray and washed with umber, but not obscuring the gray; under-parts pale neutral gray with a silvery sheen in certain lights. Snout gray; feet yellowish, sparsely clad with whitish hairs; claws rather long and hooked. Tail ringed, sparsely clad with white hairs, with a few longer interspersed but much shorter than in the generality of Indian Shrews.

Length, tip of snout to vent,	in. 4·70
,, of tail,	2·80
,, of hind foot,	0·82
,, tip of snout to eye,	0·70
,, eye to ear,	0·39
Height of ear,	0·38
Breadth of ear,	0·38

Upper incisors short and stout, curved, nearly convergent at their tips. No eminence of the cingulum on the inside of the posterior portion of the tooth which is rather broader than the base of the elongated portion. Second incisor not very large, but equalling the conjoint breadth of the third incisor and canine. The third incisor is considerably smaller than the canine, but the tip of the latter is somewhat above the level of that of the former. The premolar is not very small and it is nearly as broad as the canine behind which it directly lies, but externally it is nearly wholly hidden by the first molar. The anterior cusp on the first molar and its large cutting cusp are not strongly developed: the point of the latter is below the level of that of the second incisor. The anterior portion of the frontals is not much narrower than the portion behind the orbits. This skull is fully adult, as all the sutures have disappeared even to the basi-occipital suture.

	♀
Anterior margin of foramen magnum to tip of premaxillæ,	in. 1·10
Breadth across maxillæ (molars),	0·40
,, behind infraorbital foramen,	0·25
,, anterior to brain case,	0·26
,, external to glenoid fossæ,	0·48
,, ,, to tympanic,	0·55
Length of upper alveolar line,	0·58
Condyle of lower jaw to anterior end of alveolar line,	0·60

It inhabits (Sindh) Karáchí.

De Filippi in his description of *C. fumigata* mentions, as a character of the species, the presence "along the lower jaw, on each side of the mento-gular region, of four small prominences each bearing a long hair.". These hairs, however, are common to all shrews as far as my observations go.

Crocidura (P.) pealana, n. s.

Body slender; snout long and pointed; feet moderately slender; lower half of limbs with short hair, but the feet are moderately well clad. The claws are rather short and strong. The tail is a little more than two-thirds the length of the trunk, rounded, clad with brownish black hairs, with a few, long white hairs intermixed. Ears of moderate size, tolerably well clad, the margins of the flaps fringed with longer white hairs. Fur moderately long. General colour gray with a deep wash of brown, but with gray hairs intermixed in the adults, giving to the fur a somewhat grizzled aspect in certain lights. In aged specimens, a grayish area occurs below the eye and behind the angle of the mouth. Under surface sooty brown, or grayish, more or less washed with brownish on the chest.

Length, tip of snout to vent, ...	in. 4 70
,, of tail, ...	2·30
,, of hind foot, ...	0·73
,, snout to eye, ...	0 70
,, eye to ear, ...	0·40
Height of ear, ...	0·30
Breadth of ear, ...	0·36

The upper incisors are well developed but not very long. The posterior process is prominent but not so broad as the base of the long part of the tooth. The second incisor is large, and more than the breadth of the third and the canine: the latter is only a little smaller and shorter than the former. The anterior cusp of the first molar is about the same level as the canine. The premolar is behind the canine and is only partially visible externally. In the adult, female skull, the teeth are much worn and therefore appear very short, and the premolars have broken off, level with the alveolar border.

This species is distinguished from *C. blythii* and *C. heterodon* by its smaller feet and by its colour, also by the character of its upper incisors and by its small premolar.

	♀
Anterior margin of foramen magnum to tip of premaxillæ, ...	in. 1·13
Breadth across maxillæ, ...	0·41
,, behind infraorbital foramen, ...	0·22
,, anterior to brain case, ...	0·30
,, external to glenoid fossæ, ...	0·47
,, ,, to tympanic, ...	0·52
Length of upper alveolar line, ...	0·56
,, from condyle of lower jaw to end of alveolar line, ...	0·65

This form is one of the many additions which have been made to the fauna of Assam by Mr. S. E. Peal. The specimens were obtained at Sibságár.

Crocidura (P.) blanfordii, n. s.

Snout long, slender and attenuated. Ear moderately developed, sparsely clad with short hairs which appear as a pale fringe along the margin; flaps with longer and stronger pale hairs. Feet rather long and slender, also the toes moderately well clad with brown hairs, uniform with the body; claws yellowish, moderately strong, compressed, curved at the tips. Tail a little thickened at the base, well haired, with short, brown hairs completely obscuring the rings: long hairs white and numerous. Tail apparently considerably shorter than the trunk. Fur very short, dense and mole-like, grayish at the base, the remainder wholly brown, and showing a somewhat finely speckled appearance in reflected lights; under-parts grayish-brown with a silvery sheen; snout, feet and tail brownish; skin of ears blackish.

	Adult ♀
Length, tip of snout to vent,	in. 4·15
„ of tail,	2·35
„ of hind foot,	0·70
„ snout to eye,	0·67
„ eye to ear,	0·30
Height of ear,	0·37
Breadth of ear,	0·34

First upper incisors moderately long and close together: basal cusp conically pointed. Second incisor very large, canine somewhat larger than the third incisor. The two nearly equalled by the horizontal or basal length of the second incisor. The premolar is very small and wedged in between the canine and first molar. The point of the second incisor is somewhat below the level of the point of the chief cusp of the first molar.

	♀
Anterior margin of foramen magnum to tip of premaxillæ,	in. 0·98
Breadth across maxillæ,	0·35
„ behind infraorbital foramen,	0·22
„ anterior to brain case,	0·26
„ external to glenoid fossæ,	0·39
„ „ to tympanic,	0·50
Length of upper alveolar line,	0·49
„ from condyle of lower jaw to end of alveolar margin,	0·59

This shrew was obtained by Mr. W. T. Blanford at Khandalla, on the Western Ghâts, near Bombay, at an elevation of 2000 ft.

CROCIDURA (P.) STOLICZKANA, n. s.

Snout rather short, and broad anteriorly, not densely clad; ears not large but well developed, sparsely clad with short hairs; feet well developed but not large, and rather thinly clothed with short pale-coloured hairs; claws moderately long and pale yellow. Tail not swollen at the base, somewhat tetragonal, sparsely covered with short brown hairs, with intermixed whitish hairs which are deep black or brownish in the lower halves; tail finely ringed, 55 rings to the half inch. Snout, hands, feet and upper surface of the tail yellowish-brown, paler on the under-surface of the tail. Fur soft, silky, moderately long, dull brown above, and dark gray on the under-parts.

Length, tip of snout to vent,	in. 2·50
„ of tail,	1·90
„ of hind foot,	0·50
„ snout to eye,	0·40
„ eye to ear,	0·16
Height of ear,	0·25
Breadth of ear,	0 23

The first upper incisors are well developed, meeting in the mesial line, anteriorly and downwardly directed, with but little backward curve. There is a small but well developed tubercle on the inner side of the posterior portion which is sharp and conical. The second incisor is very large, broader than the third and the canine, and downwardly projected to almost the same level as the tip of the chief cusp of the first molar. The third incisor is slightly smaller than the canine. The premolar is about two-thirds of the size of the third incisor, but its tip is considerably below the level of the point of the anterior cusp of the first molar; it lies immediately behind the canine and is almost wholly visible externally. The skull is young, but the species does not appear to attain to any great size, and it probably does not exceed, when fully adult, more than 3 inches in length, exclusive of the tail.

Anterior margin of foramen magnum to tip of premaxillæ,	in. 0·66
Breadth across maxillæ,	0·23
„ above and behind infraorbital foramen,	0·17
„ anterior to brain case,	0·19
„ external to glenoid fossæ,	0·30
„ „ to tympanic,	0·32
Length of upper alveolar line,	0·32
Condyle of lower jaw to anterior end of alveolar line,	0·39

Hab.—Bombay. Dr. Stoliczka.

Crocidura (P.) macrotis, Anderson.

Sorex peyrottetii, Blyth, (in part.) Journ. As. Soc. Vol. XVI (1847) p. 1275.

Sorex nudipes, Blyth, Journ. As. Soc. Beng. Vol. XXIV, 1855, p. 34, Ann. and Mag. Nat. Hist. Vol. XVII, 1856, p. 21; Wagner, Schreber, Saügeth, Vol. V, Suppl. 1856, p. 805.

Pachyura nudipes, Blyth, Fitzinger Sitzgsber. Ak. Wiss. Wien. 1868, p. 172, Andr. Proc. Zoo. Soc. 1873, p. 231.

Snout seminude, long, and rather broad across the incisors, with the nasal portion attenuated. Ears very large and rather patulous, their antero-posterior breadth equalling two-thirds of the distance from their lower angles to the tip of the snout; sparsely covered with short brown hairs on their outer, and partially so, on their inner surface. Limbs rather feeble, shortly haired from the elbow and knee downwards; feet only sparsely covered with short brown hairs which are paler on the toes which are rather short. Claws well developed. Tail equalling the length of the trunk, rounded, tapering and ringed, nearly nude in appearance, owing to the shortness of the brown hairs which sparsely clothe it; moderately long, white hairs interspersed as usual. Fur very short, shining dark-brown above, which is also the colour of the upper surfaces of the snout and tail; lower half of ears, chin and feet, yellowish-brown.

	Adult ♀
Length, tip of snout to vent, in.	1·75
„ of tail,	1·27
„ of hind foot,	0·34
„ snout to eye,	0·30
„ eye to ear,	0·14
Height of ear,	0 20
Breadth of ear,	0·24

The first upper incisors are rather widely apart, directed forwards and downwards. A well developed tubercle on the inner side of the posterior portion which is conically pointed. The second incisor is large and more than equalling the longitudinal length of the third and canine; the third incisor is only a little smaller than the canine; the premolar is placed behind the canine and has a sharp point and is visible externally, but its point is much above the level of the point of the anterior cusp of the first molar: the chief cusp of this last mentioned tooth is but little longer than the second incisor.

	♂	♀
Anterior margin of foramen magnum to tip of premaxillæ,	in. 0·45	in. 0·50
Breadth across maxillæ,	0·16	0·18
„ behind infraorbital foramen,	0·12	0·14
„ anterior to brain case,	0·15	0·16
„ external to glenoid fossæ,	0·20	0·24
„ „ to tympanic,	0·25	0·27
Length of upper alveolar line,	0·20	0·20
„ from condyle of lower jaw to end of alveolar line,...	0·25	0·23

Blyth in describing this species stated that it was "remarkable for its naked feet and very large ears; also for the odoriferous glands on the sides being strongly developed, whereas we can detect them in no other of these minute species." The feet however of the type specimens, named in Blyth's own handwriting, appear to be quite as well haired, if not more so than in some other species, and, moreover, the glands on the sides are not peculiar to it as a small species, because they also occur in the two following species which are minute shrews. As the character assigned by Blyth, *viz.*, naked feet is misleading, I have re-named this species after its distinguishing feature, namely, its large ears.

It is closely allied to *C.* (P.) *perrottetii* from the Nilgiris but is distinguished from it by the character of its teeth, the first incisor being well curved with a prominent eminence at the base, and the first intermediate tooth being large and conical. Its body also is heavier than is *C. perrottetii*, Duvernoy, which resembles it in its large ears.

Inhabits Tenasserim.

CROCIDURA (P.) NITIDOFULVA.

Sorex melanodon,* Blyth, Journ. As. Soc., Bengal, 1855, Vol. XXIV, p. 33. Ann. and Mag. Nat. Hist., Vol. 17, 1856, p. 20.

Sorex (Paradoxodon) melanodon, Wagner, Schreber Suppl. Vol. V, 1855 p. 805.

Paradoxodon melanodon, Fitzinger, Sitsgb. Ak. Wiss. Wien. 1868, p. 134.

Pachyura melanodon, Blyth, Andr. Proc., Zool. Soc. 1873.

Snout pointed, but little swollen across the incisors and only partially clad with short brown hairs. Ears not very full, only moderately projecting,

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[*] Wagler in 1833 (Isis, p. 54) named a red toothed shrew, *Sorex melanodon* (= *S. vulgaris*). If we regard the genus *Crocidura* as of the same rank as *Sorex*, there is no necessity why this Shrew should be re-named on the ground that both forms are cogeneric. But an altogether different consideration induces me to suggest another name for this shrew, *viz.*, that its teeth are not black, but white.

seminude. Limbs rather feeble, seminude in lower portion of legs; the upper surface of the feet only sparsely clad with short whitish hairs. Claws well developed, yellowish. General colour of animal, shining brown above, and on the feet and tail yellowish, under surface grayish brown with a silvery sheen. Fur short, soft and silky. Tail tapering, rounded, not quite equalling the length of the trunk, ringed and only very sparsely covered with short brown hairs, with longer white hairs intermixed.

	Adolescent ♂	Fully adult ♀
Length, tip of snout to vent, ...	in. 1·67	in. 1·80
,, of tail, ...	1·08	1·05
,, hind foot, ...	0·32	0·32
,, tip of snout to eye, ...	0·27	0·27
,, eye to ear, ...	0·17	0·17
Height of ear, ...	0·19	0·18
Breadth of ear, ...	0·15	0·16

The first incisors are considerably apart anteriorly, rather short and projected forwards and downwards, a small tubercle on the inside of the posterior portion. The hinder portion of the tooth is relatively large for the size of the tooth. The second incisor is more than the breadth of the third and the canine, and is rather shortly pointed. The canine is somewhat larger than the third incisor. The premolar is very minute and is wedged in between the canine and first molar and is partially visible externally. Its point is much above the level of the cusp on the anterior border of the first molar and the apex of the latter is somewhat below the level of the point of the second incisor. There is a slight eminence on the external margin of the lower incisors near their free ends.

	♂	♀
Anterior margin of foramen magnum to tip of premaxillæ,	in. 0·48	in. 0·47
Breadth across maxillae,...	0·16	0·18
,, behind infraorbital foramen, ...	0·12	0·12
,, anterior to brain case, ...	0·15	0·15
,, external to glenoid fossæ, ...	0·20	0·21
,, ,, to tympanic, ...	0·24	0·25
Length from condyle of lower jaw to end of alveolar line, ...	0·27	
,, of upper alveolar line, ...	0·23	0·22
,, ,, lower ,, ...	0·14	0·13

The skull of the type of *S. melanodon*, Blyth, is that of a young animal, and the character which suggested to Blyth the term *S. melanodon* was doubtless due to the blood of the pulp coagulating in the tooth and shining through the translucent structure, as the teeth of none of these specimens which are undoubtedly identical with *S. melanodon* ever exhibited any trace of pigment on the outer surface of the teeth.

It inhabits Lower Bengal (Calcutta) and the valley of the Brahmaputra to Goalpara.

CROCIDURA (P.) NILGIRICA, n. s.

Form small, slender. Head long, somewhat flattened; snout rather broad, but long and rather abruptly rounded towards the nostrils. Snout densely haired, and moustachial bristles rather numerous. Ears of moderate size and not hidden, rounded and sparsely clad with short hairs. Limbs clad to the wrist and ankle, and the upper surface of the feet sparsely clad, Claws well developed and sharp; pads of feet rather prominent. Tail equals about the length from the vent to the front of the shoulder, not swollen at the base, finely ringed, about 12 to 13 rings to the one-tenth of an inch; numerous short strong hairs between the rings, with scattered, long black hairs. Fur short, dense and velvety; general colour, snout, ears, tail and upper surface of limbs, deep fuliginous velvety black, paler below with a silvery lustre. Claws yellowish.

	Adult male.
Length from tip of snout to vent,...	in. 1·78
„ of tail, ...	1·12
„ of hind foot, ...	0·35
Height of ear, ...	0·15
Breadth of ear, ...	0·15

The skull proves this specimen to be fully adult, as the sutures on the base of the cranium are obliterated. A small portion of the occipital has been broken off, but sufficient remains on one side to indicate that the foramen magnum has been very large; measured from the inferior border of the foramen magnum to the end of the palate anteriorly, the total length of the adult skull is only 0·45. The condyles are large, and there is a considerable concavity or depression immediately over the temporal fossa. The most marked feature of the skull is the character of the teeth, more especially of the first upper incisor which is short and but little if at all hooked and destitute of the marked eminence at its base posteriorly which is so distinctive of the generality of shrews. There is a slight indication of the position of the eminence on the outer side of the tooth, but no more, and the tip of the first intermediate tooth is but little below the basal portion of the first incisor, and the immediately succeeding teeth gradually diminish in size to the fourth intermediate tooth which is well developed, and in the line of the teeth before it, and almost wholly visible externally. The anterior portions of the crowns of these three teeth are rather sharply pointed. The apex of the crown of the first molar is on a level with the base of the first incisor. The last tooth has two distinct cusps. The condyle of the lower jaw is not divided by a notch.

Inferior border of foramen magnum to tip of premaxillæ,	in. 0·45
Breadth across molars,	0·17
„ at posterior border of infraorbital foramen,	0·16
„ at middle of frontal contraction,	0·13
„ external to glenoid fossæ,	0·21
„ „ to auditory canal,	0·26
Length of upper row of teeth,	0·21
„ of lower „ „ „	0·14

Inhabits the Nilgiris, and the two specimens, exactly alike, were procured at Utakamand. The Indian Museum is indebted to Colonel Beddome for these two specimens of this small, black shrew which is at once distinguished from the other minute shrew of the Nilgiris *C. perrottetii* by its much smaller ears.

CROCIDURA (PH.) TRAVANCORENSIS, n. s.

Head more elongated before the ear than in *P. nitidofulva;* ears moderately developed and sparsely clad; feet seminude, with short white hairs, hardly hiding the scaly skin. Claws well developed, sharp. Tail equalling the length of the trunk without the head, not swollen at the base, tetragonal, scaly, ringed, 43 rings to the quarter inch, not obscured by the hairs which are extremely few and short, those at the tip being longer. Long white hairs interspersed. Fur very short dense and soft; reddish brown above, the under surface grayish, with a warm tint, silvery in certain lights. Feet yellowish-brown. Tail above, concolorous with the upper surface of the body.

	♂
Length from tip of snout to vent,	in. 1·66
„ of tail,	1·19
„ of hind foot,	0·31
„ from tip of snout to eye,	0·30
„ „ eye to ear,	0·14
Height of ear,	0·19
Breadth of ear,	0·21

The skull has the facial portion more elongated than in *C. nitidofulva.* The front upper incisor is short and directed downwards, and the posterior portion of the tooth has a small tubercle on its inner side, and is large and rather sharply pointed. The second is considerably larger than the third incisor and the canine combined, and its apex reaches as far downwards as the anterior point of the first incisor. The third incisor and the canine are of equal breadth, the first of the two being the longer. The small premolar is largely visible externally although it lies between the canine and first molar. There is a slight swelling on the outer border of the lower incisor near its free end.

	♂
Anterior border of foramen magnum to tip of premaxillæ,	in. 0·49
Breadth across maxillæ,	0·18
,, behind infraorbital foramen,	0·13
,, before brain case,	0·15
,, external to glenoid fossæ,	0·20
,, ,, to tympanic,	0·26
Length from condyle of lower jaw to anterior end of alveolar line,	0·25
,, of upper alveolar line,	0·20
,, ,, lower,	0·12

This small South Indian shrew is distinguished from the small shrew of Bengal and the valley of the Brahmaputra by the absence of a lateral gland, by its more elongated skull, larger ears and longer tail.

Inhabits Travancor.

CROCIDURA (P.) BIDIANA, n. s.

Snout long and pointed. Ears moderately large and round, and rather well haired. Feet large and seminude; the lower halves of the radial and tibial portions are also seminude; claws with rather long sharp curved points. Tail not much swollen at the base, equalling the length of the trunk and one half of the head, well covered with short brown hairs, with long whitish hairs intermixed, their bases being dark brown. Snout, ears and feet, pale reddish brown, tail darker. Fur long, fine and dense, 0·35 in length, reddish brown above and below, the basal portion of the fur, as usual, being dark slaty. The under surface has also a grayish gloss.

Length, tip of snout to vent,	in. 3·20
,, of tail,	2·60
,, of hind foot,	0·80
,, tip of snout to eye,	0·70
,, eye to ear,	0·27
Height of ear,	0·27
Breadth of ear,	0·30

The foregoing specimen is a male with nearly all the sutures of the skull obliterated. The upper incisors are not very prominent and but little curved, and there is a small, but well defined tubercle on the inner side of the posterior portion of these teeth forming a sharp conical cusp. The second incisor is large and nearly equals the length of the chief cusp of the first molar. The third incisor and canine are almost of equal size, but the latter, as is generally the case, is slightly larger than the former. The premolar is small and wedged in between the canine and the first molar, is sharply conical, and nearly wholly visible externally. The anterior cusp on the first molar is small and rather blunt, and considerably above the level of the point of the canine. There is a minute eminence on the outside of the lower incisor near its tip. The total length of the upper line of tooth is 0″·45.

The skull unfortunately met with an accident before it was measured. This shrew would appear to attain to a greater size than *C. serpentarius* and to be a medium-sized species. The smaller and more rounded ears, and the short interval between the eye and the ear, its larger size and the presence of a lateral gland separate it from *C. rubicunda ;* and its strong feet distinguish it from *C. stoliczkana.*

The Museum is indebted for this species to Dr. Bidie of the Madras Central Museum, whose name I have associated with it.

(No lateral gland.)

CROCIDURA (P.) RUBICUNDA, n. s.

Snout long and pointed, not much swollen across the moustachial region, well haired. Ears large, round, very sparsely haired, rather long white hairs on the flaps. Feet slender, covered with short, nearly white hairs so as to obscure the skin and projecting over the yellow claws which are rather large and curved at the points. Tail equalling the distance from the vent to the middle of the ear measured along the side, slightly swollen at the base, round, and rather thickly clad with longish pale yellow, almost white hairs, with long white hairs intermixed. Muzzle, ears, feet and tail, pale yellowish. Fur rather long and soft, and pale rusty fawn. Under parts gray suffused with fawn.

	♀
Length, tip of snout to vent,	in. 3·40
„ of tail,	2·30
„ of hind foot,	0·64
„ tip of snout to eye,	0·63
„ eye to ear,	0·36
Height of ear,	0·33
Breadth of ear,	0·40

The first upper incisors of this female are longer, stronger and more curved than in the adolescent male of *C. bidiana*, and there is no tubercle on the inside of the posterior portion of the tooth which is not so sharply pointed as in *C. bidiana.* The second incisor is also a broader and more blunted tooth than in that species, and the third incisor is notably smaller than the canine. The premolar is largely visible externally. The lower incisors are notched in the middle, and their points are not so upwardly bent as in *C. bidiana.*

	♀
Anterior border of foramen magnum to tip of premaxillæ,…………	in. 0·93
Breadth across maxillæ, ………	0·32
,, behind infraorbital foramen, ………	0·20
,, before brain case, ………	0·25
,, external to glenoid fossæ, ………	0·39
,, ,, to tympanic, ………	0·42
Length of upper alveolar line, ………	0·49
,, from condyle of lower jaw to anterior end of alveolar line,…	0·52

The only specimen is from Parisnáth, where it was found by Dr. Stoliczka.

CROCIDURA (P.) SUBFULVA, n. s.

Crocidura murina, Andr. Journ. As. Soc. Beng. Vol. XLI, 1872, p. 223.

Snout rather short and broad: ears moderately developed, rather flattened above and rounded posteriorly and sparsely clad with pale-coloured hairs. Feet moderately large, and tolerably well clad, with pale-coloured hairs which hang over the claws which are yellow and strong. The tail equals the length of the trunk and is not swollen at the base, but it is rather thick throughout and somewhat abruptly tapers towards the point, and it is somewhat tetragonal. It is relatively well clad with short pale hairs which hide the rings, and at the point the hairs form an imperfect pencil: long white hairs are intermixed. The snout, ears, feet and tail are pale yellowish-brown; the tail paler on its under surface. General colour of the upper surface pale fawn; silvery gray on the under parts.

Tip of snout to vent 1·90; tail 1·30; hind foot 0·42.

Front upper incisors directed forwards and downwards, posterior portion moderately developed and sharply conical, a very feeble but distinct tubercle on the inside. Second incisor large, sharply pointed and nearly equalling in length the first tooth, twice as broad as the third incisor and canine. The premolar is very minute and wedged in between the canine and first molar and is partially visible externally.

Anterior margin of foramen magnum to tip of premaxillæ,	in. 0·62
Breadth across maxillæ,	0·23
,, behind infraorbital foramen,	0·12
,, before brain case,	0·20
,, external to glenoid fossæ,	0·26
,, ,, to tympanic,	0·30
Length of upper alveolar line,	0·32
,, from condyle lower jaw to anterior end of alveolar line,	0·36

These are rather young shrews, but from the condition of the skull of which I have given the measurements, it is apparent that the animal does not attain to a much larger size. It might be mistaken for the young of *C. bidiana*, or *C. rubicunda*, but the teeth being complete it is evident from the measurements of the upper dental line that its teeth are considerably smaller than the teeth of either of these species.

This species was discovered in Khach by Dr. Stoliczka who remarked that it was far from common.

CROCIDURA (P.) PYGMÆOIDES, Andr.

Sorex peyrottetii, Blyth, (in part) Journ. As. Soc. Bengal, Vol. XVI, 1847, p. 1276.

Sorex micronyx, Blyth, Journ. As. Soc. Bengal, Vol. XXIV, 1855, p. 33, (in part); Ann. and Mag. Nat. Hist. Vol. XVII, 2nd series 1856, p. 20 (in part); Cat. Mamm. As. Soc. Mus. 1863, p. 85, (in part).

Pachyura micronyx, Blyth, Fitzinger, Sitzgsber. Akad. Wiss. Wien, 1868, p. 171, (in part) Andr. Proc. Zoo. Soc. 1873, p. 231.

Snout rather long, narrow and pointed; well clad. Ears well developed and prominent, sparsely clad with short hairs, feet well developed, rather long and slender, the hind foot being especially larger than in *C. nitidofulva*, Andr. Toes moderately long, claws strong and curved. Lower portion of both anterior and posterior limbs clad with short brown hairs. Feet rather sparsely clad with short brown hairs. Tail rather long, somewhat tetragonal, and nearly equalling the length of the trunk and half of the head, ringed, 35 rings to quarter of an inch, rather densely covered with short brown hairs which nearly hide the rings. Long white interspersed hairs. Fur rather short, soft and silky. General colour rich, deep, rusty brown. Snout pale rufous brown, feet yellowish brown. Under-parts brownish with a marked silvery sheen.

	♀
Length, tip of snout to vent,	in. 1·85
„ of tail,	1·40
„ of hind foot,	0·37
„ tip of snout to eye,	0·31
„ eye to ear,	0·15
Height of ear,	0·20
Breadth of ear,	0·23

Anterior incisors well developed; posterior portion with no internal process of the cingulum; conical point, slightly directed backwards. Second incisor large, broader than the conjoint 3rd incisor and canine which have the usual relations; premolar placed behind the canine, visible externally. The anterior cusp of the first molar large, its point almost on the same level as the point of the canine; the point of the chief cusp of the first molar is nearly on the same level as the point of the first incisor.

Anterior border of foramen magnum to tip of premaxillæ,	in. 0 50
Breadth across maxillæ,	0·19
„ behind infraorbital foramen,	0·14
„ before brain case,	0·15
„ external to glenoid fossæ,	0·23
„ „ to tympanic,	0·27
Length of lower jaw, condyle to anterior end of alveolar line,	0·26
„ of upper alveolar line,	0·13
„ of lower „ „	0·13

Habitat, Himalayas.

Sub-genus CROCIDURA, Wagler.

(Lateral gland.)

CROCIDURA (Cr.) RUBRICOSA, n. s.

Snout pyramidal, moderately broad, well clad; nostrils, rounded, divided, but not much prolonged. Ears of moderate size and sparsely clad. Limbs in their lower halves sparsely clothed; also the feet which are, however, covered with short brown hairs, long over the claws which are well developed but not much curved. Tail mouse-like, equalling the distance from the vent to the angle of the mouth, somewhat tetragonal, not swollen at the base, ringed, densely covered with short brown hairs, the long white hairs confined to the basal third of the tail. Reddish brown above, more rufous on the head and snout. Feet, and under-surface of tail paler, yellowish brown. Under-parts grayish brown with a prevailing silvery sheen.

	♂
Length, tip of snout to vent,	in. 2·85
„ of tail,	2·20
„ of hind foot,	0·56
„ tip of snout to eye,	0·50
„ eye to ear,	0·21
Height of ear,	0·26
Breadth of ear,	0·29

The skull of this species is moderately elongated, with the upper front incisors close together anteriorly, but not touching, and there is a well defined tubercle on the inside of the posterior portion of the teeth which is narrow, sharp and conical. The second incisor is large and equals the third incisor and canine, the former being somewhat smaller than the latter. The anterior cusp on the first molar is sharply defined but wholly developed from the cingulum. There is a marked tubercle on the outer margin of the lower incisor and anterior to the middle.

	♂	♀
Anterior border of foramen magnum to premaxillæ,	in. 0·72	in. 0·65
Breadth across maxillæ,	0·27	0·25
„ behind infraorbital foramen,	0·18	0·19
„ anterior to brain case,	0·23	0·22
„ external to glenoid fossæ,	0·32	0·30
„ „ to tympanic,	0·37	0·35
Length of lower jaw, condyle to anterior end of alveolar line,	0·41	0·39
„ of upper alveolar line,	0·36	0·35
„ of lower „ „	0·21	0·30

The female which yielded this skull had her uterus enlarged, whilst the basi-occipital suture was perfectly intact, and her teeth surfaces unground.

This species was discovered by Mr. S. E. Peal, Sibságar, Assam, but the Museum has since obtained specimens from Purniah, Chárápúnji, and the Garo Hills.

(No lateral gland.)

CROCIDURA (Cr.) KINGIANA, n. s.

Snout moderately long, somewhat pointed and not densely clad. Ears not prominent. Feet rather narrow and small, with dark coloured pads; claws strong and curved; lower portion of limbs partially clad; upper surfaces of feet with short whitish hairs. Tail equalling the distance between the vent and the tip of the lower lip; slightly swollen at the base; somewhat tetragonal; sparsely covered with very short dark brown hairs, and a few long white hairs along its basal half. Fur dense, moderately long, velvety, dark brown above, gray or silvery brown below. Snout concolorous with the body ; feet yellowish brown.

	♂
Length, tip of snout to vent,	in. 3·20
,, of tail,	2·42
,, of hind foot,	0·60
,, tip of snout to eye,	0·51
,, eye to ear,	0·22
Height of ear,	0·28
Breadth of ear,	0·30

The front, upper incisors are close together and thus produce a more pointed snout than in *C. fuliginosa.* A well developed, tubercular eminence on the inside of the posterior portion which has a sharply pointed cusp, this portion of the tooth in *C. fuliginosa* being more blunt. The second and third incisors and canine have much the same form as in *C. fuliginosa* but they are smaller. The first molar is smaller and its anterior cusp is considerably less than in that species.

Anterior margin of foramen magnum to tip of premaxillæ,	in. 0·73
Breadth across maxillæ,	0·27
,, behind infraorbital foramen,	0·19
,, before brain case,	0·21
,, external to glenoid fossæ,	0·31
,, ,, to tympanic,	0·37
Length from condyle of lower jaw to anterior end of alveolar line,	0·22
,, of upper alveolar line,	0·36
,, of lower ,, ,,	0·21

This species which is closely allied to *C.* (*Cr.*) *fuliginosa* is yet distinguished from it, among other details in its structure by its narrower feet, although it is a larger form.

It inhabits Sikkim, whence the Museum received it from Dr. King, along with some other interesting, small mammals.

Genus SORICULUS, Blyth.

(No lateral gland.)

SORICULUS GRACILICAUDA, n. s.

Snout pyramidal, pointed, not very thickly clad. Ears moderately large, rounded, almost hidden, and clad externally with rather long hairs on their inner surfaces and their margins. The upper and lower halves of the ear are almost opposed to each other and the antitragus is thickened and placed against the orifice. The feet are rather broad and with longish claws; the lower portion of the limbs is semi-nude; the upper surface of the feet scaly, a few brownish hairs on the dorsi, with still fewer on the toes; a few long hairs projecting over the claws. Tail coarsely scaly-ringed, almost naked, but with a few short, brown hairs, with no long hairs intermixed; not swollen at the base; tetragonal, long, narrow and tapering, and equalling the length of the trunk and head; no longer hairs at the tip. Fur dense and rather long, not velvety, but soft; dark slaty in its hidden portion, the visible portion being broadly tipped with brown, the general colour of this red-toothed shrew.

Length, tip of snout to vent,	in.	2·35
,, tail,		2·13
,, hind foot,		0·52
,, tip of snout to eye,		0·45
Height of ear,		0·20

The upper front incisors are close together and are small, the posterior portions of the teeth are not acutely pointed. Second incisor rather rounded at the point and not very much larger than the third incisor which is larger than the canine; the tip of the latter tooth is slightly longer than the anterior, external, small cusp of the first molar. The central cusp of the last mentioned tooth is sharply conical but feeble, and its tip is on a level with the point of the third incisor. The points only of the intermediate teeth and the central cusp of the first molar are fully tipped with reddish, and in the lower jaw, only the incisors and canines show a feeble touch of pigment.

This shrew was found in Sikkim by Mr. W. T. Blanford.

IX.—*Notes on the Mammalian Fauna of the Wardwán and Upper Chináb Valleys.*—*By* R. Lydekker, B. A., *Geological Survey of India.*

(Recd. July 11th,—Read August 1st, 1877.)

Knowing the great importance, at the present time, of authenticated lists of the faunas of different districts, I have thought it worth while to bring to the notice of the Society, the following observations on the mammalian fauna, of the valleys of the Wardwán and upper Chináb rivers, made by me during a tour of these regions, in the course of my professional duties. The country noticed includes the greater part of the course of the Wardwán river, (namely, the part from Inshin, to its junction with the Chináb river); and also the valley of the Chináb from Kishtwár upwards to the point where this river divides into the two smaller streams of the

Chándra and the Bágha, in British Lahúl. The country is particularly interesting as being the border land between the Tibetan region on the one hand, and the so-called Himalayan region on the other.

The list of mammalia, given in the present paper, is confessedly imperfect, as it takes scarcely any notice of the micro-mammalia and none of the Chiroptera; while such larger mammalia as are noticed are chiefly those which have come under my own observation, or of which I have seen freshly-killed skins or skulls; I think, however, that the list of larger mammalia is tolerably complete.

PRIMÆTES.

Of this order I believe only two species exist in the region at present under consideration,—*viz.*, *Inuus rhesus* and *Semnopithecus (Presbytis) schistaceus.*

Inuus rhesus I have observed only in the Chináb valley, a short distance above Kishtwár, at an elevation of about 5600 feet; Jerdon in his "Mammals of India" mentions the occurrence of this species in the Himalaya, at an elevation of 5000 feet, as being the highest range of which he knew.

Semnopithecus schistaceus ranges to greater heights than the last species, and is not unfrequently seen in pine trees when covered with snow; in our district this species ranges from a short distance above Kishtwár up the Wardwán valley as far as the village of Marú or Petgám which has an elevation of about 7500 feet, beyond which point I did not observe it. In the Chináb valley I saw large numbers of this species near the village of Seri, or Sereri, at an elevation a little below 9000 feet; I think it does not range much further up the valley than the above-mentioned village. According to Jerdon the species has been observed at greater elevations than those here mentioned.

CARNIVORA.

Felis pardus is extremely common throughout the greater part of the Wardwán and upper Chináb valleys; in the latter I picked up a portion of a skull as far up as the village of Tindi. The species ranges to a considerable height in pursuit of Ibex.

Felis tigris; I have been told by a friend that an individual of this species was killed some years ago in the Wardwán: even if this be true, the species can only be regarded as an occasional straggler into these regions.

Felis uncia; of this species I have seen two skins of individuals which were killed on the southern side of the great snowy range separating the Chináb valley from Zanskár; I believe the species has never been found to the south of the Chináb, nor can I hear of its occurrence in Wardwán: its proper home is undoubtedly the Tibetan region.

I have not come across any specimens of the smaller *Felidæ,* and can say nothing as to their presence in, or absence from, the districts under consideration.

The two species of Himalayan Bear—*Ursus isabellinus* and *Ursus tibetanus*—range over the greater part of our district; the latter species is found generally at a lower elevation and in more forest-clad ground than the former; *U. isabellinus* is found over the whole of the upper Wardwán and Chináb valleys, but does not extend down to the lower elevation of Kishtwár, and becomes scarce above Triloknath; it also occurs abundantly to the south of the Chináb in the upper Chamba district. *U. tibetanus* does not, so far as I can learn, extend much higher up the Wardwán valley than the village of Petgám, something over 7000 feet in height; it is found, chiefly in the forests near the river, along the whole of the Chináb valley from Kishtwár to Tindi, beyond which I have not heard of it; like the last species it is alse common in Chamba. The north-easterly range of both species (except in the case of a few stragglers) is limited by the ranges of high mountains which separate the Wardwán valley, and the Chináb valley, from the Tibetan regions of Súrú and Zanskar.

Among the *Canidæ, Canis (Vulpes) montanus* is exceedingly common throughout the Wardwán and Chináb valleys: I have also procured specimens of another large fox* which has some resemblance to the black varieties of *Canis (Vulpes) leucopus;* but I am by no means certain as to the identity of the two forms, especially as *C. leucopus* is not mentioned by Jerdon as occurring in the Himalayas. The back of the Chináb form is fulvous, the under-parts and limbs are nearly black, with a few dirty white streaks, the outer surfaces of the ears jet black, and the tail blackish, with a white tip.

Cuon rutilans, if I may judge by tracks, occurs both in the Chináb and Wardwán valleys.

Herpestes griseus and *Mustela subhemachelana*, which are so common in Kashmír, I have not seen anywhere in the upper Chináb or Wardwán valleys.

On the Chináb, however, I have seen two specimens of a species of weasel, which I cannot identify with any of the species described in Jerdon, unless it be a variety of *Mustela kathiah*, which is only known from Nepal. Unfortunately both times that I saw these animals I had only a rifle with me, so I was unable to procure them. The fur of the body and tail is of a reddish brown colour, and there is a large white blaze on the face, quite different from any described species.

RODENTIA.

Marmots occur on the snowy range which separates the Chináb valley from Zanskar, but they do not occur on the range to the south of the

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* Mr. Blanford tells me that this form is probably *C. montanus*.

Chinab; I have been shown a considerable number of skins from the former range, all of which are characterized by having short tails and which I have no doubt therefore belong to *Arctomys himalayanus;* I have seen no specimens of *Arctomys caudatus*, from this district.

I am not aware whether or no Marmots occur in the Wardwán.

Lagomys Roylei occurs not uncommonly in the upper Chináb between Kilar and Tindi; I did not see any specimens lower down, nor any in Wardwán.

Pteromys inornatus occurs throughout the Wardwan valley and in the upper Chinab valley as far as Saneh, in considerable numbers; its peculiar cry is very frequently heard at night, especially in wooded districts.

UNGULATA.

Cervus cashmeriensis is found on the Kashmír side of the Wardwán valley, but does not extend to the opposite side, or into the Chináb district. The comparatively few individuals that are found in Wardwán may be regarded as merely stragglers from Kashmír.

Moschus moschiferus occurs throughout the Wardwán valley, and very abundantly in the Chináb valley some distance above Kishtwár; I am not aware whether or no it extends into Chináb; it becomes somewhat rare above Saneh in the Chináb valley.

Hemitragus jemlaicus is exceedingly common in the thickly wooded districts of the lower Wardwán valley, and of the lower half of the upper Chináb valley; in the latter region the village of Kilar (except in the case of stragglers) seems to mark its eastern range; this species also occurs in Chamba. The females are very generally found in the thick forests which extend down to the level of the Chináb above Kishtwár, while the males appear to prefer the more open ground which occurs at a higher level; on more than one occasion I have seen a flock of this species numbering twenty individuals.

Nemorhœdus goral is found in considerable numbers on the southern or Chamba side of the range of mountains running along the southern bank of the Chináb, and a few individuals may be found on the northern side of the same range; but the range of the species is limited to the north by the Chináb.

Nemorhœdus bubalina; of this species I have not heard of or seen any individuals in our country.

Capra sibirica; the range of this species in the Kishtwár district is limited to the west by the Wardwán river; and to the south by the Chináb; proceeding up the former river, however, as far as Petgám and Inshin, we find the species occurring on the western or right bank of the river, though not in such numbers as on the eastern or left bank. In the same manner if we follow the course of the Chináb above Kishtwár, we find that beyond the village of Tindi, Ibex, though in small numbers, occur on the southern or left bank of the river; generally they are not found on the Chamba side of the range of mountains running along the southern bank of the Chináb; but early this season a small flock was observed which had crossed the range into the Barmaor district; this being, as far as I can learn, the only instance of Ibex being seen there. To the east of the Wardwán, and to the north of the Chináb, Ibex in great numbers range over the Tibetan districts of Súrú, Zanskár and Ladák.

Wherever Ibex are found either to the west of the Wardwán or to the south of the Chináb, these rivers are bridged over during some portion of the year by snow, across which bridges the Ibex have doubtless passed from the country to the east and south of the two rivers, which is their proper home.

Capra Falconeri is not found within the district under consideration.

Sus indicus is found in the Chináb valley at and below Kishtwár, but I believe it does not range above that place, either in the Chináb or the Wardwán valley.

Though not strictly belonging to the wild fauna of the district, I may mention that the half-breed between the Indian cattle and the domesticated Yák is commonly employed in agriculture, in the Chináb valley, at and above the village of Gúlábgarh, the elevation of which place is but slightly over 6000 feet above the sea-level: this is the lowest elevation at which I have seen the half-breed living constantly in the Himalaya.

From a perusal of the above notes, it will be apparent that the valley of the upper Chináb, and in a lesser degree that also of the Wardwán, forms an ill-defined boundary-line between the faunas of the so-called "Himalayan" and "Tibetan" regions.

If we refer to a list of the Mammalia proper to the plateau of Tibet, given by Mr. W. T. Blanford in the Proceedings of the Zoological Society of London,* we shall find that the following four Tibetan species, *viz.*, *Felis uncia, Canis montanus, Arctomys himalayanus* and *Capra sibirica* extend their range into the "Himalayan" region of the Chináb, where they either mingle with or closely approach to the proper fauna of that region, such as *Ursus tibetanus, Ursus isabellinus, Hemitragus jemlaicus*, and *Nemorhædus goral.* It is worthy of notice that the last of the four above-mentioned species does not occur on the ground where the outlying "Tibetan" forms range, while the other three "Himalayan" species mingle with the "Tibetan."

There appears to be some doubt as to which of the two faunas the Musk-deer properly belongs; Mr. Blanford, in his above-quoted paper, considers that it should be referred to the "Alpine-Himalayan," and doubts the fact of its occurrence anywhere on the Tibetan plateau. I am not in a position to say definitely, in the face of such authority, that the species does occur in the latter region, but I am rather inclined to think that it must, since I have been shewn skins of this species in Ladák, said to have been procured there; moreover the Ladákis have a distinct name for the animal, *viz.*, *Láwá*,—which is not usual in the case of animals which do not occur in the country. Again Jerdon in his "Mammals of India," in treating of this species, says (taking the statement for what it is worth) that it extends into Central Asia as far as Siberia.

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* 1876, p. 633.

In separating so markedly the "Tibetan" from the "Himalayan" fauna, it must be borne in mind that there is evidence of the two having for a long period of time had means of communication with each other; otherwise we are unable to explain the very close relationship which undoubtedly exists between *Ovis Vignii* of the Tibetan plateau, and *Ovis cycloceros* of the hills of the Panjáb. It is probable that the latter must be regarded as originally a wanderer from the Tibetan fauna, which has become modified into a distinct species, now confined to the outer Himalayan district.

X.—*On the Metáḍ Rat* (Golunda meltada, *Gray) with a note on* Golunda Ellioti.—*By* W. T. Blanford, F. R. S., &c.

(Received June 21st;—Read July 4th, 1877.)

(With Plate I.)

In a paper published in the Journal for last year, Vol. XLV, Pt. 2, p. 165, I gave an account of the *Golanḍi* rat *(Golunda Ellioti)*. The great difficulty which I found in recognizing this rat from the published descriptions, and the identification of the genera *Golunda* and *Pelomys* have induced me to study some of the other peculiar murine forms found in India. The affinities of these species cannot be clearly made out without fuller descriptions of their structural peculiarities than have hitherto been available, and the skulls and teeth especially need comparison with those of other *Muridæ*. We are indebted to Dr. Peters for full accounts of the structure of two Indian rodent genera *Nesokia*[*] (= *Spalacomys)* and *Platacanthomys*[†]; but of others, such as *Golunda*, *Leggada* and *Vandeleuria* so little has hitherto been known that they are not even mentioned in Mr. Alston's recent classification of the *Glires.*[‡]

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[*] *Spalacomys indicus* (= *Nesokia Hardwickei* of Jerdon, and perhaps of Gray) Abhandl. Kön. Akad. der. Wiss. Berlin, 1860, p. 139, Pl. II, fig. 1.

[†] P. Z. S. 1865, p. 397, Pl. 20.

[‡] P. Z. S. 1876, p. 61.

The genus *Golunda* was originally proposed by Dr. J. E. Gray[*] for two species, *G. Ellioti* and *G. meltada*. The former was described in the paper mentioned above; the latter is very imperfectly known. Mr. Blyth had no specimens of *G. meltada*, and consequently could only copy the earlier descriptions in his memoir on the Rats and Mice of India.[†] Dr. Jerdon, in the 'Mammals of India' only repeated the characters given by Sir W. Elliot, but he expressed a doubt whether the species ought to be included in the same group as *G. Ellioti*, as the physiognomy, character of the fur, and habits are distinct. I quite agree with Dr. Jerdon, and it appears to me that the characters of the skull and dentition fully confirm his suggestion.

For the original discovery of this species and of most of the *Muridæ* inhabiting the plateau of Southern India we are indebted to Sir W. Elliot (at that time Mr. Elliot of the Madras Civil Service). The species was originally named by Gray[‡] *Golunda meltada*, the specific name being evidently a misreading or misprint for *mettada*. The Metád rat was again described by Sir W. Elliot[§] himself under the name of *Mus lanuginosus* and an excellent account was given of its habits. Owing to the circumstance that a peculiar caste of natives, the Waḍáris[||] or tank diggers of the Mahratta country, catch and eat rats of various kinds, and naturally have particular names for the different species, it is easier to obtain specimens, and, which is even more important, to identify them when obtained, than in the case of most Indian micro-mammals.

I am indebted to my friend the Rev. S. Fairbank of Ahmednagar for an excellent series of the metáḍ rats, comprising five skins and five specimens in spirit, all obtained from the Waḍári of the neighbourhood. The species appears much more abundant in the Ahmednagar district than the *Legyaḍe* or the *Golunḍi*, although both occur and Mr. Fairbank has procured specimens for me. The original locality, Dhárwar, is about 240 miles south of Ahmednagar.

As I have already stated, the species is not congeneric with *Golunda Ellioti*. The incisors are not grooved, the molars are like those of ordinary rats, and the palate is of the width usual in the family. I see no grounds for removing the species from the genus *Mus*.

The specific name is more difficult to decide. That *meltada* is a mistake is clear, but it is I think better to retain the oldest name, merely correcting the spelling to *mettada*, than to adopt Sir W. Elliot's term

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[*] Charlesworth's Mag. Nat. Hist. I, 1837, p. 586.

[†] J. A. S. B. 1863, XXXII, p. 352.

[‡] l. c.

[§] Madras Jour. Lit. Sci., 1839, X, p. 212.

[||] These people speak a dialect of Canarese and the names given to the different rats are of Dravidian origin.

lanuginosus, which, as its author himself pointed out to me, is not very appropriate, the fur being very soft but not woolly. Many naturalists in Germany refuse to employ "barbaric" terms, but until the question of their use or disuse can be settled by general consent, it does not appear advisable to depart from established custom. If the views above urged be adopted, the following will be the synonymy of the present species.

Mus mettada.

Golunda meltada, Gray, Charlesworth's Mag. Nat. Hist., I, p. 586, (1837).

Mus mettade, Elliot, Mad. Jour. Lit. Sci., X, p. 208, (1839).

Mus lanuginosus, Elliot, ib. p. 212, (1839).

Golunda meltada, Gray, Cat. Mam. Brit. Mus., p. 113, (1843).

'*M. meltada,* Gray,' Wagner, Schreber's Säugth., Suppl. Pt. 3, p. 421, (1843).

'*Golunda miltada,* Gray,' Blyth, J. A. S. B. XXXII, p. 352, (1863).

'*Mus meltada,* Elliot,' Fitzinger, Sitz. Kais. Acad. Wien., LVI, 1, p. 72, (1867).

Golunda meltada, Jerdon, Mammals of India, p. 213, (1867).

Metáḍ or *Mettángaṇḍu* of Waḍári.

N. B.—Golunda newera, Kelaart, Ann. Mag. Nat. Hist., Ser. 2, VIII, p. 339, (1851) was by Kelaart, on the authority of Blyth, (Prod. Faun. Zeyl. p. 67,) considered the same as the Metáḍ, although it differs in having grooved incisors, and in colour. By Blyth it was subsequently considered identical with *G. Ellioti,* Cat. Mam. Mus. As. Soc., p. 121.

Mus mettada has not hitherto, so far as I know, been recorded from any precise locality, except the Western Deccan; it probably, however, is found in others parts of the Madras Presidency. Jerdon says it has only been found in Southern India.

Description taken from 5 dried skins and 5 specimens in spirit.—Colour above brown with a slight rufous tinge, below white, the two colours not sharply divided. Fur soft, glossy and rather dense, consisting of fine hairs which beneath the microscope are found to be slightly flattened and grooved. The hairs of the upper parts are very dark leaden grey, except near the ends, where they are light brown; black tipped hairs, a little longer than the rest, being mixed as usual with the fur on the back and face, but becoming fewer in number and gradually disappearing on the sides. On the breast and abdomen the fur is lighter grey at the base, white at the ends. The length of the ordinary hairs in the middle of the back is rather less than half an inch, (about 0·42,) the longer hairs being about half an inch long. The whiskers slightly exceed the head in length, most are black, some of those near the upper lip being grey or white as a general rule, though not invariably; in one specimen, perhaps young, all are black.

The ears are very thin, rounded, subovate, nearly naked outside and inside, having only a few short hairs scattered over their surface.

The feet are very light brown above, the soles flesh-coloured, with a greyish tinge; there are only five tubercles or pads, as a rule, on the hind foot, the outer hinder tubercle being absent or rudimentary, and the inner small: five nearly equidistant pads on the fore foot. The hallux of the fore foot is quite rudimentary, but has a small teguline nail, the other nails are compressed. The second digit is shorter than the fourth, the fifth terminates nearly on a line with the junction between the third and fourth. On the hind foot there is but little difference in the length of the three middle toes, the third is a little the longest, the other two nearly equal; in individuals either may be slightly longer than the other; the fifth is rather longer than the first, but neither, without its claw, extends so far as the divisions between the other toes.

The tail is shorter than the head and body together, it is of moderate thickness at the base, (the diameter is 0·2 inch in an adult male,) and tapers gradually to the point; it is closely ringed with scales and thinly clad with short bristly hairs, which are blackish above, pale below.

In the female there are two pairs of pectoral and two of inguinal mammæ, both of the latter far behind the anterior edge of the thigh, and unusually close together, the anterior being, in one adult female, only a quarter of an inch from the posterior on the same side; the pectoral mammæ are, as in many mice and rats, one pair, in front, inside the shoulders, and the other pair behind the armpits.

I have extracted two skulls, one from an adult male in spirit, the other from the skin of a female. The general form differs but little from that of most species of *Mus*. The upper surface is slightly convex, the convexity being more pronounced on the nasal portion. The ante-orbital foramen is large, the zygomatic arch moderately stout. The incisive (anterior palatal) foramina are of great length, and extend back for some distance bstween the anterior molars. The bony palate between the molars is not nearly so narrow as in *Golunda Ellioti,* nor are the molars so broad. The latter appear to differ in no respect from those of other species of *Mus*. The incisors in both jaws are deep orange, not sulcated in front; those of the upper jaw nearly flat in front, those of the lower jaw convex.

The following dimensions are those of a male and female, both fully adult, preserved in spirit.

	♂ in.	♀ in.
Total length from nose to end of tail, ...	9·2	8·
Length of head and body from nose to anus, ...	5·	4·25
,, of tail, ...	4·2	3·75
,, of ear from orifice, ...	0·75	0·7
Breadth of ear laid flat, ...	0·62	0·6
Length of hind foot (without claws),.............................	1·05	0·9
,, of fore foot (,,) from behind proximal tubercle to end of middle toe,......................................	0·45	0·4
Longest whisker, ...	1·25	1·3

The following measurements are from the skull of an adult male, the specimen figured—

	inch	metre
Length of skull from occipital plane to end of nasal bones,	1·38	·0345
Greatest breadth across zygomatic arches,......................	0·62	·016
Length of suture between nasal bones, ...	0·51	·013
Breadth of frontal bones between orbits, ...	0·22	·0055
Length of anterior palatine foramina,...........................	0·32	·008
Do. of row of upper molars, ...	0·28	·007
Breadth of bony palate between anterior upper molars, ...	0·12	003
Length of lower jaw from angle to symphysis, ...	0.75	·0175
Height of ditto to coronoid process, ...	0·42	·0105
Length of row of lower molars, ...	0·24	·006

Additional note on Golunda Ellioti (see J. A. S. B., 1876, Pt. II, p. 165).

During the past cold season I obtained several specimens of this rat in lower Sind. The following measurements, in inches, of 3 males and a female were taken upon the bodies when quite fresh.

	1 ♂	2 ♂	3 ♂	4 ♀
Total length from nose to end of tail, ...	10·2	——	9·4	9·7
Length from nose to anus, ...	6	6	5·5	5·2
Do. of tail, ...	4·2	——	3·9*	4·5
Do. of ear from orifice, ...	0·7	0·75	0·65	0·68
Breadth of do. laid flat, ...	0·7	——	0·65	0·68
Hind foot (without claws), ...	0·95	1·05	0·9	1·05
Fore foot (ditto), ...	0·4	0·42	0·45	0·42

The two first males and the female were fine specimens and fully adult. The tail of No. 2 was deficient and the ear much torn. All were brought to me by natives and said to be found amongst bushes. The tail in these specimens is shorter in proportion to the body than in examples preserved in spirit.*

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* Not quite perfect.

The fur is harsh. In the description previously given I omitted to mention that fine hairs are mixed with the coarse flattened and grooved piles which form the greater portion of the fur.

As the figure of the head which accompanied the previous paper (Vol. XLV, Pl. X.) was not very correct a fresh figure is added. It is taken from another female. In males the head is still more bluff.

The following is the synonymy:

GOLUNDA ELLIOTI.

Golunda Ellioti, Gray, Charlesworth's Mag. Nat. Hist., I, p. 386, (1837).

Mus Golundee, Elliot, Madras Jour. Lit. Sci., X, p. 208, (1839).

Mus hirsutus, Elliot, ib. p. 213, (1839).

'*M. Ellioti*, Gray,' Wagner, Schreber's Säugth. Supt., Part 3, p. 421, (1843).

Golunda Ellioti, Gray, Cat. Mam. Mus. Brit. Mus., p. 113, (1843).

Mus coffæus, Kelaart, Prod. Faun. Zeyl., p. 67, (1852).

Golunda Ellioti and *G. coffæus*, Blyth, J. A. S. B., XXXII, pp. 350, 351, (1863).

G. Ellioti, Blyth, Cat. Mam. Mus. As. Soc., p. 121, (1863).

G. Ellioti, Jerdon, Mammals of India, p. 212, (1867).

"*Mus Golunde*, Elliot," Fitzinger, Sitz. Kais. Ac. Wien, LVI, 1, p. 72, (1867).

Pelomys Watsoni, W. Blanf. Proc. A. S. B., 1876, p. 181.

Golunda Ellioti, W. Blanf. J. A. S. B., 1876, Vol. XLV, Pt. 2, p. 165, Pl. X.

EXPLANATION OF PLATE I.

Fig. 1. Head of *Mus mettada*. 2, 3, 4, Views of the skull. 5, Incisors, seen from the front. 6, molars of upper jaw, left side, double the natural size. 7, molars of lower jaw, left side. 8, right fore-foot. 9, right hind-foot.

Fig. 10. Head of *Golunda Ellioti*.

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* The following are the measurements of Nos. 2, 3 and 4 of the above list after being preserved for four months in spirit.

	2 ♂	3 ♂	4 ♀
Total length,	——	8·4	8·4
Nose to anus,	5·15	4·5	4·25
Tail,	——	3·9	4·15
Length of ear,	0·65	0·65	0·6
Breadth of ditto,	——	0·65	0·6
Hind foot,	1·02	1·	1·

It will be seen that the only measurement which has altered much is that of the body, which has greatly diminished. This is of some importance, and it shews the necessity for a record of the condition of micro-mammalia when measured, whether the carcase is that of an animal freshly killed or of one preserved by any means. Measurements of dried specimens are of course only a rough approximation.

XI.—*Record of the Occurrence of Earthquakes in Assam during the* C. S. I., V. C., *Chief*

Date.	District.	Time of occurrence.
2nd May, 1874.	Shillong, Khasi Hills.	8 P. M.
13th June, 1874.	Tura, Garo Hills.	12.30 P. M.
13th do.	Shillong, Khasi Hills.	Midnight.
14th do.	Cachar.	0.24 A. M.
16th do.	Cherra Poonji, Khasi Hills.	8 P. M.
17th do.	Mangaldai, Darrang.	9.30 A. M.
6th July, 1874.	Shillong, Khasi Hills.	1.40 P. M.
3rd Augt. 1874.	Jorhat, Sibsagar.	11.30 P. M.
2nd Sept. 1874.	Shillong, Cherra Punji.	8.20 P. M.
17th do.	Darrang.	9.30 P. M.
20th do.	Nowgong.	4.52 P. M.
8th Nov. 1874.	Tura, Garo Hills.	3.15 P. M.
23rd do.	Tezpur, Darrang.	3 P. M.
6th Dec. 1874.	Tezpur, Darrang.	7 P. M.
18th do.	Tura, Garo Hills.	3.55 A. M.
Do.	Shillong, Khasi Hills.	4.30 A. M.
26th do.	Jowai, Khasi Hills.	10.11 P. M.
29th do.		12.15 P. M.
Do.	Cachar.	10 P. M.
23rd Jan. 1875.	Goalpara.	10.15 P. M.
Do.	Kamrup, Barpeta.	10.48 P. M.
Do.	Khasi and Jaintea Hills, Jowai.	10.55 P. M.
24th do.	Do. do.	12.30 P. M.
25th do.	Do. Shillong.	1 P. M.
7th Feb. 1875.	Do. Shillong.	8.30 P. M.
11th June, 1875.	Sibsagar, Jorhát.	2.25 P. M.
Do.	Khasi and Jaintea Hills, Shillong.	2.58 P. M.
3rd Sept. 1875.	Kamrup, Barpeta.	8.57 A. M.

years 1874, 1875, 1876. *Communicated by* COL. R. H. KEATINGE, *Commissioner.*

Duration.	Extent of damage if any, and general Remarks.
......	No damage done.
4 or 5 seconds.	No damage done. The shock was a mild one.
......	No damage done.
......	No damage done.
......	No damage done.
......	No damage.
10 seconds.	No damage done.
30 seconds.	Very slight. No damage done.
2 seconds.	No damage.
15 seconds.	Slight shock.
8 to 10 seconds.	Very distinct, but not severe; accompanied by a rumbling noise.
40 seconds.	No damage. Shock very slight.
A few seconds.	The rumbling noise was the only indication that there was an earthquake.
A few seconds.	No damage. Shock hardly perceptible; noise very distinct.
45 to 50 seconds.	No damage. Shock slight.
4 seconds.	No damage. Shock slight.
3 seconds. 3 seconds.	Slight. These shocks were not felt at Shillong or Cherrapoonji.
5 seconds.	Very slight.
$\frac{1}{4}$ minute.	No damage was caused. It had been rather close all day.
Not given.	No damage done.
2 seconds.	No damage done. The shock was a very slight one, and was felt only at Jowai.
3 seconds.	No damage done. The shock was felt only at Jowai.
2 seconds.	No damage done. The shock was slight, but was felt throughout the District.
2 seconds.	No damage done. The shock was felt at Jowai and Shillong.
10 seconds.	No damage done. The earthquake was a very slight one.
2 seconds.	No damage done. The shock was felt at Shillong and Jowai.
40 seconds.	Slight cracks in several of the arches of the court house and in two or three places in walls. The pucca temple in the Kirtanghur compound also cracked and the buildings over the ghat there were quite demolished. No accidents to man or cattle.

Date.	District.	Time of occurrence.
3rd Sept. 1875.	Nowgong.	9 A. M.
Do.	Sibsagar, Jorhat.	9 A. M.
Do.	Darrang, Mangaldai.	9.15 A. M.
Do.	Khasi and Jaintea Hills, Shillong.	9.26 A. M.
Do.	Kamrup, Gauhati.	9.30 A. M.
Do.	Cachar.	9.30 A. M.
Do.	Darrang, Tezpur.	9.30 A. M.
Do.	Sylhet.	9.30 A. M.
Do.	N. Lakhimpur.	9.45 A. M.
Do.	Lakhimpur, Jaipur.	9.45 A. M.
Do.	Lakhimpur, Dibrugarh.	9.45 A. M.
Do.	Goalpara, Dhubri.	About half-past 9 or 10 A. M.
Do.	Sibsagar, Golaghat.	10 A. M.
Do.	Lakhimpur, Jaipur.	10 A. M.
Do.	Do.	10.15 A. M.
Do.	Lakhimpur, Dibrugarh.	10.35 A. M.
Do.	Garo Hills.	10.53 A. M.

Duration.	Extent of damage if any, and general Remarks.
About 30 seconds.	The severest shock felt here since 1869. All of the public buildings more or less damaged, with the exception of the Treasury and Post office, which escaped.
10 minutes.	No damage has been done as far as noticed. Besides the severest shock, lasting for 10 minutes, herein mentioned, there were many less severe shocks following.
About 60 seconds.	The severest shock known; even more so than the earthquake of 1869. The private room of the officer in the cutchery damaged; walls cracked in 2 or 3 places. The private bungalow of the sub-divisional officer very much damaged; every wall more or less injured. The shock was very violent.
10 seconds.	Was felt throughout the district and caused damage to several houses at Shillong.
80 seconds.	Jail walls to south-west thrown down, and almost all other public buildings more or less injured.
About 2 minutes.	No damage done, but there were some very smart shocks; the water in ponds rose up to the banks, and it was some time before it settled down again.
About 2 minutes.	All brick buildings in the station damaged, some severely.
Not given.	None.
3 minutes.	Most of the arches and posts over door-ways of all sub-divisional buildings cracked, and a good deal of plaster in other portions loosened.
About 60 seconds.	None.
About 10 seconds.	Two cracks caused in the Fort Tower wall. The first shock was a prolonged and severe one, though not severe enough to have caused much material damage.
About a minute or a minute and a half.	None. The earthquake commenced with slight trembling of the earth, which was noticeable for a short time before the smarter shocks occurred, and was not preceded by a rumbling noise. The smarter shocks were sufficiently strong to knock down bottles standing on end or tables on other places.
10 minutes.	It made several cracks in the Treasury walls; no other damage as yet known. From general opinion there has been no such earthquake for the last 7 years. There were also two small shocks, one at about 10½ A. M. and another about 11 A. M.
Not given.	None.
Do.	Do.
About 3 seconds.	Do.
80 seconds.	Very sharp shock but no damage done.

Date.	District.	Time of occurrence.
3rd Sept. 1875.	Kamrup, Barpeta.	8.55 P. M.
Do.	Sibsagar, Jorhat.	9 P. M.
Do.	North Lakhimpur.	9 P. M.
Do.	Sibsagar, Golaghat.	9 P. M.
Do.	Garo Hills.	9.5 P. M.
Do.	Goalpara, Dhubri.	9.30 P. M.
4th Sept. 1875.	Kamrup, Gauhati.	2 A. M.
Do.	Sibsagar, Golaghat.	3 A. M.
Do.	Darrang, Tezpur.	3.40 A. M.
Do.	Lakhimpur, Jaipur.	5 A. M.
Do.	Garo Hills.	5.15 A. M.
Do.	Nowgong.	5.30 A. M.
Do.	Kamrup, Barpeta.	5.22 A. M.
Do.	Khasi Hills, Shillong.	5.55 A. M.
Do.	Kamrup, Gauhati.	6 A. M.
Do.	North Lakhimpur.	6 A. M.
Do.	Sibsagar, Golaghat.	6 A. M.
Do.	Sylhet.	6 A. M.
Do.	Cachar.	6 A. M.
Do.	Lakhimpur, Dibrugarh.	6.10 A. M.
Do.	Darrang, Tezpur.	6.30 A. M.
Do.	Sibsagar, Jorhat.	7 A. M.
Do.	Do. do.	4 P. M.
Do.	Nowgong.	4.12 P. M.
Do.	North Lakhimpur.	5.30 P. M.
Do.	Kamrup, Barpeta.	8.56 P. M.
Do.	Sibsagar, Golaghat.	9 P. M.
Do.	Garo Hills, Tura.	9 P. M.
Do.	Nowgong.	9.5 P. M.
Do.	Goalpara.	After 9 P. M.
Do.	Khasi and Jaintea Hills, Shillong.	9.30 P. M.
Do.	Darrang, Tezpur.	9.30 P. M.
Do.	Goalpara, Dhubri.	About 9.50 P. M.
Do.	Kamrup, Gauhati.	10 P. M.
5th Sept. 1875.	Do. do.	3.35 P. M.
Do.	Sibsagar, Golaghat.	6. P. M.
Do.	Garo Hills, Tura.	6.19 P. M.
Do.	Kamrup, Barpeta.	6.20 P. M.

Duration.	Extent of damage if any, and general Remarks.
10 seconds.	None.
4 minutes.	Do.
Not given.	Do.
1 minute.	A slight shock.
About ½ minute.	None.
½ a minute.	Very slight shock.
2 or 3 seconds.	None.
2 minutes.	Do. a slight shock.
10 seconds.	No apparent damage done.
Not given.	None.
About 1 minute.	No damage.
Not given.	None.
6 seconds.	Do. shock rather a sharp one.
2 seconds.	The shock was felt at Shillong and Jowai.
5 or 6 seconds.	None.
½ minute.	Do.
2 minutes.	Heavy and durable shock. No damage has been reported.
Not given.	None. A very slight oscillation.
About 5 seconds.	Only one shock; very slight, inasmuch as the clocks were not stopped.
About 3 seconds.	None. The shock was not a severe one; 3 more shocks are said to have been felt during the night; one at 9 P. M., one about 12, and the third about 3 A. M.
10 seconds.	None.
2 minutes.	Do.
2 minutes.	Do.
An instant.	Do.
½ minute.	Do.
20 seconds.	A mild shock.
3 minutes.	No damage. A heavy shock.
About ½ minute.	None.
30 seconds.	None. A pretty smart shock.
About a minute.	Do. Slight shock.
About 4 seconds.	Felt throughout the district.
About 20 seconds.	No apparent damage.
About a minute.	None. Slight shock.
Very short.	None.
4 or 5 seconds.	None.
5 seconds.	A strong shock. No damage.
About 2 minutes.	None. Preceded by a rumbling sound.
About 50 seconds.	A mild shock followed by a sharp one. No damage.

Date.	District.	Time of occurrence.
5th Sept. 1875.	Kamrup, Gauhati.	6.30 P. M.
Do.	Nowgong.	6.30 P. M.
Do.	Darrang, Mangaldai.	6.35 P. M.
Do.	Goalpara, Dhubri.	1.45 P. M.
Do.	Darrang, Tezpur.	6.45 P. M.
Do.	Goalpara.	6.45 P. M.
Do.	Khasi and Jaintea Hills, Shillong.	6.45 P. M.
Do.	Sylhet.	7 P. M.
Do.	Sibsagar, Jorhat.	7 P. M.
Do.	North Lakhimpur.	7 P. M.
Do.	Cachar.	7 P. M.
Do.	Lakhimpur, Dibrugarh.	7.15 to 7.20.
Do.	Nowgong.	7.15 P. M.
6th Sept. 1875.	Khasi and Jaintea Hills, Shillong.	7.30 P. M.
Do.	Kamrup, Gauhati.	7.30 P. M.
7th Sept. 1875.	Khasi and Jaintea Hills.	3.30 A. M.
Do.	Lakhimpur, Dibrugarh.	3.45 A. M.
8th do.	Sibsagar, Golaghat.	12 P. M.
Do.	Goalpara, Dhubri.	2 A. M.
Do.	Kamrup, Barpeta.	Past midnight.
9th do.	Sibsagar.	1 A. M.
Do.	Sibsagar, Jorhat.	1 A. M.
Do.	Nowgong.	1.15 A. M.
Do.	Darrang, Tezpur.	1.15 A. M.
Do.	Khasi and Jaintea Hills.	1.18 A. M.
Do.	Kamrup, Gauhati.	1.20 A. M.
11th Sept. 1875.	Darrang, Tezpur.	3 A. M.

Duration.	Extent of damage if any, and general Remarks.
About 6 seconds.	None.
About 30 seconds.	Do. This shock was not nearly so severe as that of the 3rd, but unlike that shock it was accompanied by a loud sound like the rumbling of distant thunder.
Not given.	The shock lasted a long time, about 75 seconds, but fortunately it was not very severe.
About 2 minutes.	None. The shocks were somewhat smarter than the three next preceding occurrences.
40 seconds.	No apparent damage.
About a minute.	No damage. The shocks were very slight, preceded by a slight rumbling noise.
About 15 seconds.	The shock was of some violence, but caused no damage: it was felt throughout the district.
Not given.	None.
5 minutes.	Do.
½ minute.	Do.
About a minute.	No damage done.
About 10 seconds.	The shock was a sharp one: about 9 P. M. of Saturday the 4th, another shock is said to have been felt.
30 seconds.	None. Attended with a distant rumbling noise like thunder.
2 seconds.	The shock was felt only at Jowai.
4 seconds.	None.
2 seconds.	None. Only felt at Jowai.
A few seconds.	A single smart shock unaccompanied by any noise.
3 minutes.	A slight shock, no damage has been reported.
About a minute.	None but slight shocks.
Not noted.	No damage.
About 28 seconds.	No damage reported. There was excessive heat on the day previous, the common thermometer rising to 94° and no rain.
About 2 minutes.	No damage appears to have been done.
About 30 seconds.	No damage done. This shock was fainter than either of the two others reported, and was unattended by any rumbling sound.
15 seconds.	None apparently.
2 seconds.	None.
Short.	More cracks in walls of Cutchery and much plaster dislodged. Record office slightly cracked, also Post Office and School house.
10 to 15 seconds.	The shock was very distinct but not severe. No damage done by it.

Date.	District.	Time of occurrence.
12th Sept. 1875.	Darrang, Tezpur.	1.30 A. M.
Do.	Lakhimpur, Jaipur.	2.55 A. M.
Do.	Nowgong.	3 A. M.
Do.	Lakhimpur, Dibrugarh.	3.10 A. M.
Do.	Sibsagar, Jorhat.	3.30 A. M.
13th do.	Sibsagar, Golaghat.	10 A. M.
Do.	Sibsagar, Jorhat.	11 A. M.
Do.	Nowgong.	11.10 A. M.
Do.	Darrang, Tezpur.	11.10 A. M.
Do.	Kamrup, Gauhati.	11.15 A. M.
Do.	Khasi and Jaintea Hills, Shillong.	11.30 A. M.
Do.	Nowgong.	1.40 A. M.
Do.	Kamrup, Gauhati.	2 A. M.
17th do.	Sibsagar, Golaghat.	11.30 P. M.
Do.	Darrang, Tezpur.	A few minutes before midnight.
Do.	Nowgong.	Midnight.
Do.	Lakhimpur, Dibrugarh	Do.
19th. do.	Darrang, Tezpur.	12.45 A. M.
21st do.	Nowgong.	Between 3 and 4 A. M.
Do.	Darrang, Tezpur.	¼ to 4 A. M.
22nd Sept. 1875.	Darrang, Tezpur.	12.40 P. M.
23rd do.	Do.	2.75 A. M.
24th do.	Do.	9.30 P. M.
Do.	Do.	2.30 A. M.
26th do.	Do.	3.45 A. M.

Duration.	Extent of damage if any, and general Remarks.
15 to 20 seconds.	The shock was very distinct but not severe. No damage done by it.
Unknown.	No damage done. The shock was a sharp one. Particulars cannot be given.
About 5 seconds.	None. Slight shock.
2 seconds.	None known.
4 or 5 minutes.	No damage done.
10 seconds.	Do. Slight shock.
2 minutes.	No damage done.
5 seconds.	None. Shock slight; morning warm, Temp. 85°: at time of earthquake, weather cloudy and temperature fell to 84°.
5 to 10 seconds.	None.
5 to 10 seconds.	None. Slight and short.
About 2 seconds.	The shock was very slight and felt at Shillong and Jowai.
10 seconds.	None; pretty sharp.
Not observed.	Slight and short. No damage.
1 minute.	A strong earthquake followed by many shocks.
5 to 8 seconds.	A very sharp shock while it lasted, but did no damage.
30 seconds.	Shock very slight; no damage done.
A second.	Nothing known, but no damage is likely to have occurred.
10 to 12 seconds.	No damage done, but the shock was a very smart one, and the usual rumbling noise that precedes the shock lasted longer than usual.
15 to 20 seconds.	No damage done. This was however one of the severest of the minor shocks since the first great shock of 3rd instant.
3 to 5 seconds.	Two very sharp and distinct shocks with an interval of 4 to 5 seconds between each. The shocks were not preceded by the usual rumbling sound, nor were the shocks as if the earth undulated wave-like, but each of the shocks was very sharp as if the earth was locally violently shaken. No damage done.
5 to 8 seconds.	The shock was slight but marked and distinct; no damage done.
Do.	Sharp shock, but no damage done.
A few seconds.	Slight but distinct.
Do.	Do.
Do.	No damage. No rumbling noise preceded the shock, which was slight but marked.

Date.	District.	Time of occurrence.
26th Sept. 1875.	Darrang, Tezpur.	9.45 P. M.
28th do.	Do.	About midnight.
29th do.	Do.	9.30 A. M.
4th Oct. 1875.	Lakhimpur, Dibrugarh.	11.55 A. M.
23rd do.	Kamrup, Barpeta.	10.12 P. M.
29th do.	Goalpara.	9.30 P. M.
2nd Nov. 1875.	Goalpara, Dhubri.	4.30 A. M.
3rd do.	Goalpara.	4 A. M.
Do.	Nowgong.	4.55 A. M.
Do.	Darrang, Tezpur.	5.25 A. M.
6th do.	Do.	8.5 P. M.
18th do.	North Lakhimpur.	2.30 P. M.
Do.	Sibsagar, Golaghat.	2.30 P. M.
Do.	Lakhimpur, Dibrugarh.	2.30 P. M.
Do.	Lakhimpur, Jaipur.	3 P. M.
24th do.	Cachar.	8.15 P. M.
Do.	Garo Hills, Tura.	8.51 P. M.
Do.	Khasi and Jaintea Hills, Shillong.	9.10 P. M.
24th Dec. 1875.	Sibsagar, Golaghat.	9.30 P. M.
Do.	Darrang, Mangaldai.	9.30 P. M.
Do.	North Lakhimpur.	9.55 P. M.
Do.	North Lakhimpur, Dibrugarh.	10 P. M.
5th Jany. 1876.	Darrang, Mangaldai.	1.15 P. M.
	No reports of this Earthquake	
17th do.	Lakhimpur, Dibrugarh.	10.30 P. M.
Do.	North Lakhimpur.	11.30 P. M.
	No reports of this Earthquake	
26th do.	North Lakhimpur.	2.40 A. M.
Do.	Sibsagar, Golaghat.	3.30 A. M.
Do.	Garo Hills, Tura.	3.5 A. M.

Duration.	Extent of damage if any, and general Remarks.
A few seconds.	A very long rumbling noise preceded the shock, which was slight, but marked, and only lasted a few seconds. No damage.
5 to 10 seconds.	Slight. No damage.
10 to 15 seconds.	Very marked and distinct, but not severe, and preceded by heavy rumbling noise.
About 30 seconds.	No damage done.
About 5 seconds.	A very slight shock accompanied by rumbling noise.
About 1 minute.	A slight shock preceded by a rumbling noise. No damage done.
Less than half a minute.	Nil.
About 15 seconds.	A slight shock.
15 seconds.	None.
5 seconds.	None.
10 to 12 seconds.	No damage done, but shock very distinct and marked.
3 minutes.	No damage.
5 seconds.	Strong shock. No damage has been reported.
1 or 2 seconds.	None. A smart shock.
2 seconds.	As most extraordinarily severe but brief shock. Only one single motion was felt, but that was strong enough to crack an arch in this cutcherry and nearly to throw a gentleman staying here from his chair.
About ½ minute.	A smart shock. No damage.
30 seconds.	None. Shock was rather severe.
15 seconds.	The shock was of some violence but caused no damage; it was felt throughout the district.
10 seconds.	Strong shock. No damage has been reported.
About 10 seseconds.	No damage. A prolonged rumbling noise preceded the earthquake.
5 minutes.	No damage.
10 seconds.	No damage. The shock was rather severe.
5 to 8 seconds.	Slight, no damage.
received from other districts.	
2 seconds.	Sharp shock, accompanied by a deep rumbling noise. No damage.
1 minute.	No damage.
received from other districts.	
1 minute.	No damage.
30 seconds.	No damage. Strong shock.
About 1 minute.	No damage, oscillation gradually increased and then gradually subsided. Preceded by a rumbling sound.

Date.	District.	Time of occurrence.
26th Jan. 1876.	Gauhati, Kamrup.	3.15 A. M.
Do.	Khasi Hills, Shillong.	3.20 A. M.
Do.	Darrang, Tezpur.	3.20 A. M.
Do.	Nowgong.	3.50 A. M.
Do.	Sibsagar, Jorehat.	3 P. M.
Do.	Naga Hills, Samaguting.	3.40 P. M.
Do.	Garo Hills, Tura.	4.28 P. M.
Do.	Khasi Hills, Shillong.	4.45 P. M.
		No other report of this
28th do.	Cachar.	8.15 A. M.
Do.	Naga Hills, Samaguting.	8.15 A. M.
Do.	Khasi Hills, Shillong.	8.30 A. M.
Do.	Garo Hills, Tura.	8.59 A. M.
Do.	Nowgong.	9 A. M.
		No other report of this
5th Aug. 1876.	Khasi Hills, Shillong.	6.30 A. M.
		No other report of this
13th Sept. 1876.	Nowgong.	1 A. M.
Do.	Darrang, Tezpur.	1 A. M.
Do.	North Lakhimpur.	9.30 A. M.
		No other report of this
1st Oct. 1876.	Darrang, Tezpur.	9.25 P. M.
		No other
7th do.	Cachar.	10.30 A. M.
Do.	Khasi Hills, Shillong.	10.30 A. M.
		No other

Duration.	Extent of damage if any, and general Remarks.
About 1 minute.	No damage done.
About 1 minute	Violent shock. Felt throughout district; a few houses in Shillong slightly cracked.
More than a minute.	Shock violent, but no damage was done. Preceded by a rumbling sound.
30 seconds.	Violent shock. Kachari walls slightly cracked.
About 1 minute.	No damage.
A few seconds.	Slight shock. No damage.
20 to 25 seconds.	Several sharp shocks, but no damage done.
2 seconds.	Shock felt only at Shillong. No damage done.
Earthquake received.	
2 seconds.	One slight shock.
2 seconds.	Two slight shocks, unaccompanied by noise. No damage.
3 seconds.	Shock felt throughout the district. No damage done.
1¼ minutes.	Two severe shocks, preceded by a trembling motion which gradually decreased. No damage.
20 to 30 seconds.	Very slight shock.
Earthquake received.	
2 seconds.	Very slight shock felt at Jowai and Shillong.
Earthquake received.	
A few seconds.	A very slight shock.
2 seconds.	A very slight shock.
30 seconds.	No damage. This shock is stated to have been felt by some persons in Dibrugarh, but the Deputy Commissioner did not feel it.
Earthquake received.	
12 to 15 seconds.	No damage of any kind, but the shock was well defined, and in jerks, not continuous.
report received.	
2 seconds.	A single slight shock.
2 seconds.	No damage done. A slight shock felt throughout the district.
report of this Earthquake received.	

Date.	District.	Time of occurrence.
13th Nov. 1876.	Darrang, Tezpur.	10.35 A. M.
14th do.	Do.	1.35 P. M.
12th Dec. 1876.	Khasi Hills, Shillong.	5.35 A. M. also at 6, and a few minutes after 6.
13th do.	Goalpara.	4.15 A. M.
Do.	Goalpara, Dhubri.	5 A. M.
Do.	Nowgong.	5 A. M.
Do.	Cachar.	5.5 A. M.
Do.	Sylhet.	5.7 A. M.
Do.	Garo Hills, Tura.	5.15 A. M.
Do.	Darrang, Tezpur.	5.40 A. M.

No report of this Earthquake received from Kamrup.

20th do.	Cachar.	4.30 A. M.
Do.	Khasi Hills, Shillong.	4.45 A. M.
21st Dec. 1876.	Garo Hills, Tura.	4.45 A. M.
Do.	Sylhet.	4.45 A. M.
Do.	Darrang, Tezpur.	5 A. M.

Duration.	Extent of damage if any and general Remarks.
A few seconds.	Accompanied by a rumbling noise as of artillery waggons going over stony ground, slight, but distinct.
A few seconds.	Preceded by the usual rumbling noise. Slight, but distinct, and felt by all.
2 minutes.	The first two shocks were violent, the subsequent shocks were slight. No damage done.
15 seconds.	No damage caused. Shock felt by the whole Station.
About 1 minute.	Smart shock.
10 seconds.	No damage done. Shock distinctly perceptible.
5 seconds.	Four or five smart shocks. Severe enough to extinguish a "chirágh."
Not stated.	There were two shocks, one about half a minute after the other.
1½ minutes.	Preceded by a rumbling noise. No damage done.
1 minute.	No damage done; the shock was severe and continuous, in wavy motion, not in sharp short jerks, as in the bad earthquake of September 1875.
Sibsagar, Lakhimpur, Khasi Hills or Naga Hills.	
2 seconds.	3 or 4 shocks. No damage done.
1 minute.	Violent shock, but no damage done.
40 seconds.	Slight shock.
10 to 12 seconds.	Sharp shock. No damage done.

XII.—*Notes on a collection of Chiroptera from India and Burma, with descriptions of new species.*—*By* G. E. Dobson, M. A.; M. B.; F. L. S. &c.

(Received 30th October. Read 7th November, 1877.)

[Of the collections described in the following paper, only a portion of the specimens from Sind were obtained by myself. The other Sind specimens were collected and given to me by Mr. H. E. Watson, For the Travancore collection I am indebted to Col. R. H. Beddome, and the Burmese bats were obtained by Mr. Limborg in the neighbourhood of Moulmain.

W. T. Blanford.]

Mr. W. T. Blanford has very kindly sent to me for examination an interesting collection of Chiroptera consisting of specimens obtained in Sind, in the hills near Travancore, and in Burma; representing in all twelve species, whereof I find that two are undescribed.

I.—Species from Sind.

1. *Cynopterus marginatus.*

Pteropus marginatus, Geoffroy, Ann. du Museum, XIV, p. 97.

This small species of frugivorous bat is generally distributed throughout India, but has not hitherto, so far as I know, been recorded from Sind.

2. *Scotophilus Temminckii.*

Vespertilio Temminckii, Horsfield, Zoolog. Researches in Java, (1824).

Exceedingly common in India. Specimens of this species are rarely absent from the smallest collections.

3. *Scotophilus pallidus.*

Scotophilus pallidus, Dobson, Monogr. Asiat. Chiropt. p. 186, (1876).

The third specimen of this species as yet obtained. It agrees in structure and in measurements with the type specimen, but the colour of the fur is darker, being light chestnut brown above, and brownish buff beneath, the base of the hairs on both surfaces pale buff.

Hab. Near Shikarpur, Sind.

4. *Vesperugo abramus.*

Vespertilio abramus, Temminck, Monogr. Mammal. II, p. 232, (1835-41).

One specimen of this widely distributed species.

5. *Vesperugo Kuhlii.*

Vespertilio Kuhlii, Natterer, Wetterau. Annal. IV, p. 58, (1817).

Specimens agreeing in the light colour of the fur with others previously obtained by me from the sandy districts of Northern India.

Hab. Shikarpur, Sind.

6. *Vesperugo* (*Vesperus*) *nasutus*, n. sp.

Head flat, muzzle conical, the extremity projecting considerably beyond the lower lip in front, as in the species of the genus *Nyctinomus*, terminated by the margins of the nostrils which open sublaterally; ears shorter than the head, triangular, with rounded off tips; the inner margin of the conch commences above the eye and does not form a distinct rounded lobe at its base, but is straight almost from the base to the tip of the ear; the outer margin is also straight and terminates rather abruptly midway between the tragus and the angle of the mouth; tragus much longer than broad, directed slightly inwards, reaching its greatest width about the middle of the inner margin, outer margin convex with an ill-defined lobe near the base, inner margin slightly concave, tip subacutely pointed.

Tail almost wholly contained in the interfemoral membrane, the last rudimentary caudal vertebra alone free; no post-calcaneal lobe; wings from the base of the toes.

Fur short: above, pale yellowish brown; beneath, pale buff, almost white: membranes light brown traversed by numerous white reticulations.

The face is nearly naked in front of the eyes; a few hairs fringe the lips, and the under surface of the projecting extremity of the muzzle; the wing and interfemoral membranes are almost naked.

Upper inner incisors moderately long and unicuspidate, outer incisors very short, but slightly exceeding the cingulum of the inner incisors in vertical extent: lower incisors trifid, crowded, placed across the direction of the jaws: the single upper premolar close to the canine as in *V. serotinus*; the first lower premolar not half the second in vertical extent, with a prominent internal and anterior basal cusp.

Length, head and body 1″·8: tail 1″·7: head 0″·68: ear 0″·6; tragus 0″25; forearm 1″·45; thumb 0″25; third finger (metacarp. 1″·3; 1st ph. 0″·48; 2nd ph. 0″·7): fourth finger (metacarp. 1″·3; 1st ph. 0″·4; 2nd ph. 0″·4); fifth finger (metacarp. 1″·3; 1st ph. 0″·28; 2nd ph. 0″·28) tibia 0″·55; foot 0″·28.

Hab. Shikarpur, Sind.

II.—SPECIES FROM TRAVANCORE.

1. *Phyllorhina speoris.*

Vespertilio speoris, Schneider, Schreber, Säugeth. I, pl. 59B.

This species appears to be very generally distributed and in great abundance, in Southern India. Almost all collections from the Deccan contains examples of it. The presence of a small spine-like process at the commencement of the lower third of the outer margin of the ear-conch readily distinguishes the species from all other closely allied forms.

2. *Phyllorhina fulva.*

Hipposideros fulvus, Gray, Mag. Zool. Bot. II, p. 592, (1838).

Almost as common in Southern India as the foregoing species, and very variable in the colour of its fur, in the attachment of the wing-membrane to the posterior extremities, and in the size of the ears.

3. *Megaderma lyra.*

Megaderma lyra, Geoffroy, Ann. du Mus. XV, p. 190, (1810).

This species may be considered characteristic of the Indian and Ceylonese subregions. Its place in Burma is taken by *M. spasma*, L. It is very generally distributed throughout the Indian Peninsula, inhabiting caves, ruined buildings, and the roofs of houses.

4. *Scotophilus Temminckii*, Horsfield.

III.—SPECIES FROM BURMA.

1. *Phyllorhina larvata.*

Rhinolophus larvatus, Horsfield, Zoolog. Researches in Java, (1824).

Specimens agreeing in colour (bright chestnut) with others obtained at Prome, Upper Burma, by Dr. Anderson in 1868. Indian specimens of this species are darker coloured, and many have a bluish tinge.

HAB. Moulmein.

2. *Vesperugo (Hesperoptenus) Tickelli.*

Nycticejus Tickelli, Blyth, J. A. S. B. XX, p. 157.

Hitherto recorded from the Peninsula of India only. The next species is new and belongs to the same subgenus.

HAB. Tenasserim.

3. *Vesperugo (Hesperoptenus) Blanfordi*, n. sp.

Head very flat and broad ; muzzle obtusely conical ; nostrils opening widely apart by semi-lunate apertures, the margins of which are level with the extremity of the muzzle : ears short, triangular in outline, with broadly rounded off tips ; upper half of the outer margin of the ear-conch straight, then convex, slightly concave opposite the base of the tragus, terminating abruptly in a deep lobe closer to the angle of the mouth than to the base of the tragus; tragus narrowest opposite the base of its inner margin, expanded above and curved inwards.

Thumb short with a very acute claw; *a broad adhesive cushion occupies the base of the inferior surface of the metacarpal bone* and extends outwards and backwards upon the base of the metacarpal of the second finger.

Feet very small, the sole of the foot apparently adhesive but not expanded as in *V. pachypus;* post-calcaneal lobe remarkably large, (probably proportionately larger than in any other species of bat,) and broader than the foot, with a central cartilaginous prop: the extreme tip of the tail alone projecting.

Fur dark reddish-brown above, slightly paler beneath. *Penis with a distinct bone,* in shape quite similar to that of *V. Tickelli,* and with a similar prepuce.*

Dentition almost similar to that of *V. Tickelli,* the outer upper incisors are even smaller and placed more behind the inner incisors; the inner incisors unicuspidate and very acutely pointed; lower incisors trifid, and placed in the direction of the jaws; the single upper premolar close to the canine; the first lower premolar with a very short and obtuse cusp, the second equals three-fourths the canine in vertical extent.

Length, head and body, 1″·75; tail 1″·1; head 0″·6; ear 0″·45; tragus 0″·18; forearm 1″·1; thumb 0″·15; third finger (metacarpal 1″·0; 1st ph. 0″·6; 2nd ph. 0″·6); fourth finger (metacarp. 1″·0; 1st ph. 0″·53; 2nd ph. 0″·28); fifth finger (metacarp. 0″·95; 1st ph. 0″·35; 2nd ph. 0″·22); tibia 0″·45; foot 0″·25.

HAB. Tenasserim.

This species is about the size of *Vesperugo (Vesperus) minutus.* Temm. from South Africa, and is, therefore, one of the smallest species of the genus. It is not half the size of *V. Tickelli,* with which it agrees in other respects so closely. Its resemblance to that species in the position of the upper outer incisors, and in the form of the penis, which has a distinct bone, is very remarkable.

XIII.—*Description of* Spiraculum Mastersi,—*By* W. T. BLANFORD, F. R. S., &c.

The shell described below was collected with several others in 1860 by Mr. Masters in the hills south of the Assam Valley, not far from Golaghát. I described all the species, but the paper was never published. Some of the specimens, however, have since been distributed with the names I gave originally, and the *Spiraculum*, which is the most remarkable and interesting of all the shells found, has been figured in the 'Conchologia Indica' from a decorticated specimen. As no description of this curious form has ever been published, I give one.

---

* See description of *V. Tickelli* in Monogr. Asiat. Chiropt. p. 114.

This shell differs from all other known forms of *Spiraculum* by having the last whorl free and descending for a considerable distance, and by having, besides the sutural tube, a projection, frequently of a subtubular form, from the top of the peristome. The species has some resemblance to *Rhiostoma*, and still more to *Opisthoporus birostris*.

SPIRACULUM MASTERSI.

Syn. '*Pterocyclos (Sp.) Mastersi*, Blanford, MS.,' Hanley and Theobald, Conch. Ind., Pl. V, f. 1.—Pfeiffer, Mon. Pneum., Supp. Tert. pp. 54, 386.

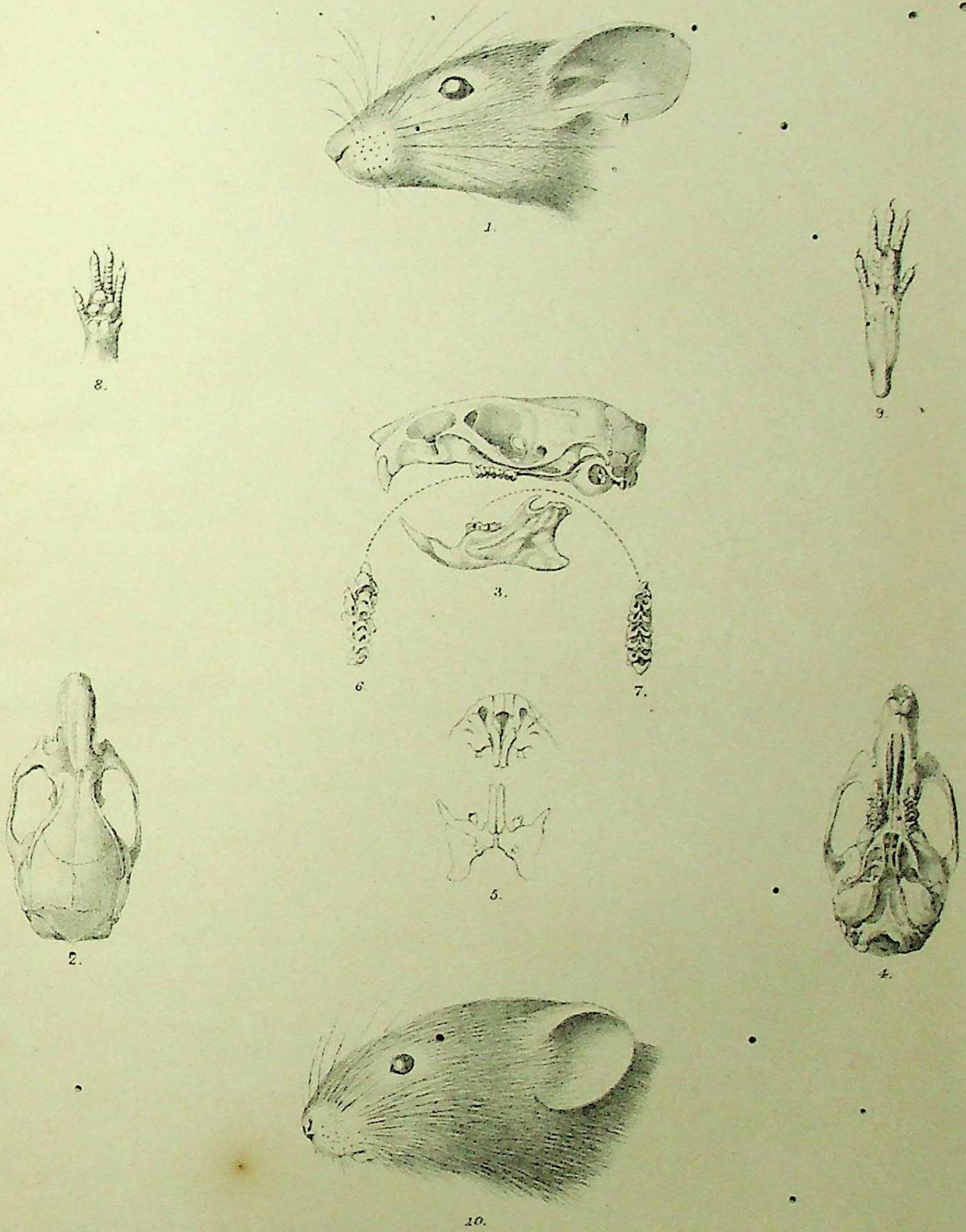
Testa latissime umbilicata, depressa, epidermide crassiusculâ, fuscâ, scabrâ, decussato-subcostulatâ induta, atque liris tribus pilosis, unâ juxta peripheriam, alterâ supra, tertiâ infra, circumdata; sub epidermide alba, fasciis angulatis transversis castaneis notata; lineis incrementi confertis lirisque spiralibus minutis magis distantibus decussatim ornata. Spira fere plana, apice vix emersâ. Anfr. 5, *rotundati, ultimus antice longe solutus, valde descendens, paulo ante solutionem tubulo brevi, curvato, pervio, longitudinaliter striato, ad anfr. penultimum excurrente, antice compresso, in rimam apertam intra anfractum ultimum desinente, postice tereti, extus patente,* 6-8 *mill. pone aperturam oriente, munitus. Apertura diagonalis, circularis; peristoma incrassato-expansum, subduplex, superne in rostrum subtubuliforme, antice porrectum, excurrens. Operculum corneum, intus concavum, extus convexum, marginibus anfractuum liberis lamelliferis. Diam. maj. peristomate incluso* 24, *min.* 16½, *alt.* 5, *ap. diam. intus* 6 *mill.*

Hab. in montibus Naga dictis, ad latus meridionale provinciæ Assam, haud procul a Golaghat.

The figure in the Conchologia Indica represents a specimen completely divested of its epidermis and more brightly coloured than usual. The subtubular projection from the upper portion of the peristome is frequently much more developed than in the figure. The three hairy ridges on the epidermis surrounding the last whorl are only found in fresh well preserved specimens. In a drawing which I possess, made from a living individual, the hairs on these ridges are shewn to be arranged in tufts.

Journ: Asiat: Soc: Bengal, Vol: XLVI. Pt II. 1877.

PLATE I.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1-9 MUS METTADA.
10 GOLUNDA ELLIOTI

J. Schaumburg lith.

CONTENTS

OF THE NATURAL HISTORY PART (PT. II.) OF THE

JOURNAL OF THE ASIATIC SOCIETY OF BENGAL FOR 1876.

No. 1, (issued June 26th, 1876). *On the General Theory of Duplex Telegraphy* (with a Woodcut).—*By* Louis Schwendler.—*On some Lizards from Sind, with Descriptions of new Species* of Ptyodactylus, Stenodactylus, *and* Trapelus (Pls. I and II).—*By* W. T. Blanford.—*On certain protracted Irregularities of Atmospheric Pressure in the Indian Monsoon region, and their Relation to Variations of the local Rainfall.*—*By* H. F. Blanford.—*Description of a new Species of* Phasmidæ (Pl. XI).—*By* J. Wood-Mason.—*Description of* Felis Shawiana, *a new Lyncine Cat from Eastern Turkestan.*—*By* W. T. Blanford.—*Description of a new Species of* Cetoniidæ.—*By* J. Wood-Mason.

No. 2, (issued August 18th, 1876). *An Account of Experiments made in* 1875 *and* 1876 *in various parts of India, for the purpose of comparing the observed Temperature of the Dew-point with that computed from the Psychrometer by different methods of Reduction.*—*By* H. F. Blanford.—*List of the Birds collected on the Expedition into the Dafla Hills, Assam, together with those obtained in the adjacent Darrang Terai* (Pls. III and IV).—*By* H. H. Godwin-Austen.—*On the Physical Geography of the Great Indian Desert with especial reference to the former Existence of the Sea in the Indus Valley; and on the Origin and Mode of Formation of the Sand-hills.*—*By* W. T. Blanford.

No. 3, (issued November 14th, 1876). *A Sketch of the Vegetation of the Nicobar Islands* (Pls. XII and XIII).—*By* S. Kurz.—*Description of* Golunda Ellioti *from Sind* (Pl. X).—*By* W. T. Blanford.—*On the* Cyclostomacea *of the Dafla Hills, Assam* (Pls. VII and VIII, A).—*By* H. H. Godwin-Austen.—*Descriptions of some new Land and Fresh-Water Shells from India and Burmah* (Pl. XIV).—*By* W. Theobald.—*Description of new Species of* Blattidæ *belonging to the Genus* Panesthia.—*By* J. Wood-Mason.

No. 4, (issued April 19th, 1877). *Fifth List of Birds from the Hill Ranges of the North-East Frontier of India* (Pls. V, VI, and IX).—*By* H. H. Godwin-Austen.—*Contributions towards a Knowledge of the Burmese Flora.*—*By* S. Kurz.—*On the* Helicidæ *collected during the Expedition into the Dafla Hills, Assam* (Pl. VIII).—*By* H. H. Godwin-Austen.—*On the Physical Explanation of the Inequality of the two Semi-diurnal Oscillations of Barometric Pressure.*—*By* H. F. Blanford.—*Contributions towards the knowledge of the Fossil Flora in India. I. On some Fossil Plants from the Damuda Series in the Raniganj Coalfield, collected by* Mr. J. Wood-Mason (Pls. XV—XXI).—*By* Ottokar Feistmantel.

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OF THE

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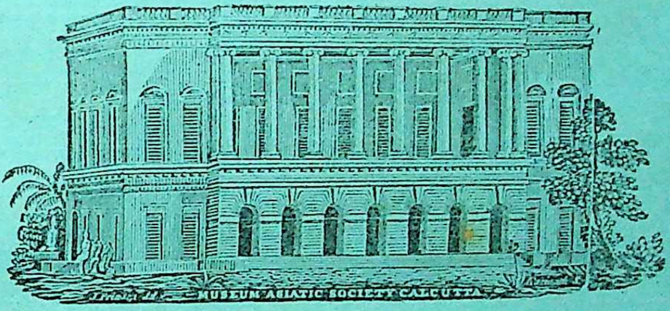
Vol. XLVI, Part II, No. IV.—1877.

EDITED BY

THE NATURAL HISTORY SECRETARY.



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CONTENTS.

Page

XIV.—*Note on two Species of Asiatic Bears, the "Mamh" of Baluchistán and* Ursus pruinosus, *Blyth, of Tibet, and on an apparently undescribed Fox from Baluchistán.—By* W. T. Blanford, F. R. S., &c., ... 315

XV.—*On an apparently new Hare, and some other Mammalia from Gilgit.—By* W. T. Blanford, F. R. S., &c., ... 323

XVI.—*On a supposed new Sheep from the Central Hills of Kelat.—By* A. O. Hume, C. B. 327

XVII.—*Catalogue of the recorded Cyclones in the Bay of Bengal up to the end of* 1876, *compiled by* Henry F. Blanford, *Meteorological Reporter to the Government of India,* 328

XVIII.—*Memorandum on the diurnal Variation of Atmospheric Pressure at the Sandheads.—By* Chas. Harding, Esq., *with a prefatory note by* Henry F. Blanford, ... 339

XIX.—*Notes on* Phasmidæ.—By J. Wood-Mason, ... 342

Index to Vol. XLVI, Part II, for 1877, ... 353

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part II.—PHYSICAL SCIENCE.

No. IV.—1877.

XIV.—*Note on two Species of Asiatic Bears, the "Mamh" of Balúchistán and* Ursus pruinosus, *Blyth, of Tibet, and on an apparently undescribed Fox from Balúchistán.—By* W. T. Blanford, F. R. S., &c.

(Received and Read Novr. 7th, 1877.)

For some years past I have endeavoured to obtain a specimen of the small bear, which is known to inhabit Baluchistan and the hilly regions of Western Sind. This bear is well known to residents in Sind by its Baluch name of "Mamh" or "Mum," and individual animals have on rare occasions been found straying on to the alluvial flats of the Indus valley. I first heard of a dark-coloured bear in Western Balúchistán, when I accompanied Major St. John on the Perso-Baluch boundary Survey in the year 1872, but neither at that time, nor in the course of several months spent in Sind in 1875-76-77, could I procure a skin for examination. I have seen fresh tracks of the animal in the Khirthar range in Western Sind, and not only I myself, but several friends have endeavoured to obtain a specimen. Not long since a discussion took place in the columns of the 'Pioneer' newspaper as to this animal, and it was suggested that it might be a baboon, and hinted that it must be a myth. The latter hypothesis appeared supported by the extraordinary tales told of the animal by the inhabitants of the country, such as their belief that, except in the presence of man, it always walks on its hind legs, and a still more remarkable tale, that all "Mamhs" are females, that each seizes a man and forces him to cohabit with her, after laming him to prevent his escaping, the young being, of course, "Mamhs" like the mother. Probably the folk lore of Baluchistan would furnish many other wonderful stories of the animal, if enquiry were made.

Quite recently my friend Major Mockler, the Political Agent at Gwádar on the Makrán coast, who has very kindly been trying, for some time past, to procure this and other animals for me, obtained a skin from a Baluch chief, Mir Wajedád of Túmp, about 70 miles north of Gwádar. This skin, which I received a few days since, had unfortunately remained for two months at Gwádar during Major Mockler's absence and without his knowing of its arrival, and much of the hair has consequently come off, but still there is abundance left to shew the characters of the fur. The skull is wanting, but the feet have been partly preserved.

From the circumstance that I was assured by all my native informants both in Sind and Baluchistan that the "Mamh" was a black bear, I was rather inclined to anticipate that it might prove to be the common Indian sloth bear *Ursus (Melursus) labiatus*. We have no precise information as to the bears of Afghanistan, but *Ursus isabellinus* of the Western Himalayas and *U. syriacus* which inhabits Persia are both pale coloured animals, and although the Indian bear is not, so far as I am aware, known to occur within the Indus valley, or the desert tracts which bound that valley to the eastward, (it is mentioned by Stoliczka as a very rare straggler into the easternmost part of Cutch,) still it might of course be found in the Balúchistán hills. A single glance at the skin sent by Major Mockler is however sufficient to shew that it belongs to a very different animal from the sloth bear of India. The latter has long coarse black hair and very long claws; in the Balúchistán skin the hair is brown, rather short, and moderately fine, and the claws are unusually small.

It is impossible to identify the Sind and Balúchistán animal with the black *Ursus torquatus* (commonly but most improperly known as *U. tibetanus)* and the only remaining bears of western and central Asia are *U. arctos, U. syriacus* and *U. isabellinus.* It is still a moot point amongst naturalists how far these forms are distinguishable, but they all agree in being large bears, considerably exceeding *U. labiatus* in dimensions, whilst the skin from Balúchistán entirely bears out the statement made by various observers, and confirmed by all the information which I have been able to procure in Sind, that the "Mamh" is an exceptionally small form of the genus. Even if the present specimen be immature, the texture of the fur appears harsher, and the hairs shorter than in *U. arctos* and its allies, whilst the colour distinguishes the species from *U. torquatus.* There can I think be but little doubt that the present animal is unnamed; it may be an exceptionally small race of *U. arctos*, but even in this case the difference is so great as to entitle the Balúchistán animal to a distinctive name. I propose therefore to call it, from the ancient name of the country it inhabits.

URSUS GEDROSIANUS, sp. nov.

Syn. *U.* sp. (*?? Melursus labiatus*) Zoology of Persia, p. 47.

Ursus *minor, brunneus, torque pectorali albido, pilis breviusculis indutus, unguibus brevibus. Longitudo tota vix quinque pedes: unguibus singularibus in pede antico sesqui-pollicaribus.*

The colouration is nearly uniform, being a dark rufous brown, much the same as the ordinary tint of European individuals of *U. arctos.* The shoulders and the outside of the limbs appear to be darker than the back, the belly paler. On the breast there is a narrow white semicircular collar, the ends of which are not prolonged upwards in front of the shoulders as in *U. isabellinus;* the muzzle is whitish and the extremity of the chin white. The ears are not preserved. The claws are dark coloured, (several have been lost,) the inner claw on the fore foot measures 1·6 inches in a straight line from base to tip, the second claw on the hind foot 1·25 in the same manner. The sole of the hind foot, somewhat dried and contracted of course, measures 7 inches, and the whole skin, which has been dressed, but apparently not stretched, is about 4½ feet long from nose to rump.

The fur, though not very coarse, is harsh and stiff, the hair is about 2½ inches long on the shoulders, but not more than 1½ elsewhere. The hairs are rather thin, probably from the animal having been killed in the hot season. Major Mockler writes to me that he is endeavouring to procure a better specimen and a skull, and I hope that it will be possible before long to give a more complete description of this bear and its affinities.

Concerning the range of *U. Gedrosianus,* it appears to be found throughout the hills of Balúchistán to the foot of the Persian highlands. When travelling through western Balúchistán in 1872, Major St. John learned that the pale coloured Syrian bear replaces the dark Balúchistán animal near Bam in Narmashir. To the west, as already noticed, the 'Mamh' is found in all the higher hills of western Sind, from the neighbourhood of the sea to the Bolán pass, and it probably occurs throughout Kelát. To the northward we know very little about bears; none are mentioned by Hutton in his 'Rough notes on the Zoology of Candahar,' J. A. S. B. XIV, p. 349, &c., and we have no precise information as to the kind which inhabits Afghanistan, except that Burnes (Cabool, p. 163), says it is of a reddish brown colour, which renders it possible that the species may be identical with that found in Balúchistán.

Before describing a fox, of which two specimens were sent by Major Mockler with the skin just described, it may be as well to give a description of another imperfectly known species of bear, for the skin of which I am indebted to Mr. L. Mandelli. The skin was brought to Mr. Mandelli at Darjiling by a man who said that he had purchased it at Lhassa, and that the animal inhabited the plains in the neighbourhood of that city. I could find no description of this animal until Dr. Anderson called my attention to a notice by Mr. Blyth in the Society's Journal for 1853, Vol. XXII, p. 589, of an imperfect skin, supposed to be that of a variety of the Himalayan black bear (*Ursus torquatus* v. *tibetanus*) for which the name *pruinosus* was suggested, should the species prove distinct. Whilst I doubt whether a name thus bestowed has any claim to recognition, I shall retain the term proposed in the present case, as it appears unobjectionable. The specimen was briefly noticed in Blyth's Catalogue of the Mammalia in the Museum of the Asiatic Society, and in Jerdon's 'Mammals', as the 'Blue Bear' of Tibet, a name under which the original specimen was sent by Dr. Campbell. The skin now received is perfect and in fair condition, but the greater part of the skull is wanting, only the jaws having been retained with the skin, and even of these the hinder teeth are defective. The animal was probably of considerable size, judging by the teeth, which are much larger than any in the skulls of *U. isabellinus* in the Museum, except in one case, of which more presently. It is manifest that the animal is distinguished by the characters of the fur, claws and dentition, from *U. torquatus*, and that it is in all probability closely allied to *U. isabellinus*, and consequently to the European bear, *U. arctos*.

URSUS PRUINOSUS.

Blyth, J. A. S. B., 1853, XXII, p. 589.

'Blue Bear' of Tibet; Blyth, Cat. Mam. Mus. As. Soc., p. 76.—Jerdon, Mammals of India, p. 71.

Ursus *major*, *affinis* U. isabellino, *supra fusco-fulvus*, *pilis dorsalibus longiusculis*, *confertis*, *submollibus*, *nigris*, *fulvo-terminatis*, *capite humerisque fulvis*, *artubus nigris*, *unguibus pallidis fortibus*.

The general colouration above is tawny brown, palest on the head and shoulders, darker on the back, where the hairs are black with tawny tips, and black on the limbs. The head is tawny, much of the same colour as *Ursus isabellinus*, a little darker and browner under the eyes and on the forehead: the ears have tufts of long hair mixed tawny and black. Behind the head the neck is rather darker, but on the upper part of the breast there is a broad pale tawny crescentic band, with the upper terminations prolonged upwards, in front of the shoulder, almost to the back, precisely as in *U. isabellinus*. In *U. labiatus* and *U. torquatus* the band is confined to the breast, and the same appears to be the case in *U. Gedrosianus*. The upper and hinder parts of the shoulders in *U. pruinosus* are covered with tawny hairs about 3½ to 4 inches long, whilst the interscapulary region, like the rest of the back, is clothed with black hairs, fulvous at the tips. The hair is moderately fine and about 3 inches long on the back. Apparently the animal when killed was about to lose its long winter coat, for the hair is much felted and matted together in places, and a short fine tawny hair is seen to be growing beneath. The hoary appearance given to the fur by the fulvous tips is extremely characteristic, but it may very possibly be less conspicuous at some seasons.

The claws are pale in colour, strong, and moderately curved, the first (and largest) claw on the fore foot measuring 2·2 inches in a straight line from insertion to tip, and 2·75 round the curve; the corresponding measurements of the first hind claw are 1·3 and 1·4 inches.

The animal is evidently old, several of the premolars have been lost, and the alveoli obliterated; the molars are much worn. As already mentioned the size of the teeth and especially of the molars is unusually large; the canines appear very little larger than in *U. labiatus.* The posterior molar in the upper jaw is wanting on one side and imperfect on the other, it must be nearly 1¼ inches long and its anterior portion is 0·88 broad, the ante-penultimate (1st true molar) measures 0·9 inch in length by 0·72, the tooth anterior to this or hindmost premolar is 0·62 long. The three together when perfect must have measured nearly 3 inches in length. The 1st lower true molar measures 1·02 long by 0·53 broad, the second 1·05 by 0·63, the 3rd and hindmost 0·83 by 0·62.

It has already been mentioned that there is in the Society's old collection, now in the Indian Museum, a very large bear's skull attributed to *Ursus isabellinus.* The skull, No. 224, G. of Blyth's Catalogue is called "Enormous skull from Kashmir purchased 1858." I was, I believe, with Mr. Blyth when he purchased this skull in the Calcutta Bazaar, at the shop of a dealer in all kinds of similar articles, where heads of various animals from very different parts of India were mixed together. Thus I remember myself purchasing on the same occasion an *Ovis Hodgsoni* skull and a fine frontlet of *Cervus Duvaucelli;* one of course from Tibet originally, the other from the plains of India. I should consequently attach no importance whatever to the supposed locality.

Now the teeth of this large bear's skull resemble those in the jaws of Mr. Mandelli's specimen of *Ursus pruinosus* so closely, that it is by no means improbable that both may have belonged to the same species. The former is larger than any other skull of *Ursus isabellinus* in the Museum and the molar teeth are unusually large, though still inferior in size to those of *U. pruinosus.* The following are a few dimensions:

Length from anterior edge of *foramen magnum* to end of premaxillaries,	12·5

Breadth across hinder portion of zygomatic arches, ...	8·8
Breadth of frontal bones between orbits, ...	3·3
Breadth of palate between posterior molars, ...	1·9
Length of 3 posterior molars in upper jaw, ...	2·7
Length of lower jaw from angle to symphysis, ...	9·8

The bears of India and the neighbouring regions, so far as known, now consist of the following species :

Ursus Malayanus. Malay Peninsula and Burma to Arakan.

U. torquatus. Forest region of the Himalayas, and, it is said, the hills South of Assam.

U. pruinosus. Plains of Eastern Tibet.

U. isabellinus. Western Himalayas, chiefly above the forests, unknown in Tibet, and even in the Upper Indus Valley, Ladakh, &c.

U. (*Melursus*) *labiatus.* Plains and hills of Peninsular India and Ceylon, extending, it is said, into the hills South of Assam.

U. Gedrosianus. Hills of Western Sind.

Of the above *U. pruinosus* is the only species not found within Indian limits. The discovery that *Ursus pruinosus* is widely different from *U. torquatus* removes the last excuse for applying to the latter animal a name derived from a country in which no such species exists. The range of *Ursus torquatus* has now been fairly ascertained to be Cis-Himalayan in Southern Asia, although some naturalists refer bears from Japan and Eastern Siberia to the same species, and as the use of the specific name *Tibetanus* involves a serious error, some other term should be substituted.

Fortunately in this instance there is no need to suggest a new name, for Wagner,* in 1841, proposed to call this bear *U. torquatus* on the ground that the animal not being known in Tibet, the original name given by Cuvier was inappropriate. Wagner's name was adopted by Schinz†, and subsequently by Dr. J. E. Gray‡, who however appears to quote Schinz as its author. Mr. Blyth, in the 'Catalogue of the Mammalia in the Museum Asiatic Society,' p. 77, referred *U. torquatus*, Schinz, to *U. labiatus*, but this is evidently a mistake, as can be seen from Schinz's description and from the facts mentioned above. It is probable that Mr. Blyth, who worked under the disadvantage of having a very imperfect scientific library at command, took the reference from some other authority.

No one can be more averse than I am in general to changing specific names, but I think, following the British Association rule, that a name should be altered when it involves serious error, that the change is justified in the present instance.

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* Schreber, Säugethiere, Supplement band, II, p. 144.

† Syn. Mam., I, p. 302.

‡ P. Z. S., 1864, p. 688; Cat. Carn. Pach. Edent. Mam., Brit. Mus., 1869, p. 225.

With the skin of *Ursus Gedrosianus*, Major Mockler sent to me two well-preserved skins and a perfect skeleton of a singularly small and very grey fox, with the following note : ‘ I send two skins and a skeleton of the ‘ Poh’ which seems to be a very diminutive fox. They were shot by one of my ‘ sepoys in the hills about 15 miles from Gwádar ; he sat up at night for ‘ them over water, and threw about some dates and fish as bait.’

The ‘ Poh’ appears to me to be the same as the small Bushire fox, which, in the Zoology of Persia,[*] I referred, with doubt, after examining a young living specimen at the Zoological Gardens in London, to *Canis famelicus*,[†] Rüpp. That the present animal must however be distinct from that described by Rüppell is, I think, shewn by the dimensions : in *Canis famelicus* the length of the head is 5 inches 6 lines, (French measure = 5·85 English,) and the whole length from nose to end of tail 2 ft. 10 in. (about 3 feet English,) of which the tail is 1 ft. 2 in. (1 ft. 3 in. English). Now in the little Baluchistan fox, the skull is only about 3½ inches long and the whole length of the skeleton 2 ft. 7 in. of which about 1 ft. 1 in. belong to the tail. It is not clear whether Rüppell in measuring the tail included the hair at the end, if he did, that would account for 2 or 3 inches of the length and the present animal would have a proportionally longer tail, but in any case, allowing for the probability that the measurements given in Rüppell's work are from a stuffed specimen, the difference in the size of the head is quite inconsistent with the identification of the Baluchistan animal with *Canis famelicus.* The colour moreover in the former is much greyer, and the chesnut dorsal stripe of *C. famelicus* wanting or very faintly represented. I propose to name the Baluchistan fox from its grey colour.

VULPES CANUS, sp. nov.

‘ *Vulpes famelicus ?* Rüpp.’ Eastern Persia, II, p. 41.

V. parvus, V. famelico *affinis sed minor, magis griseus, atque fasciâ dorsali castaneâ fere vel omnino carens, capite nuchâ tergoque anteriore interdum rufescentibus, dorso nigro-lavato, pilorum apicibus albis, abdomine albido, auriculis extus isabellino-griseis, caudâ pilis longis albidis supra posticeque nigro terminatis, indutâ. Long. tota, pilis ad extremitatem caudæ inclusis, circa* 33, *caudæ* 15, *cranii* 3·6, poll. angl.

The general colour is grey, blackish on the back and the upper portion and end of the tail, the lower parts from the breast including the under surface of the tail white, the muzzle in front of the eyes dusky brown, sides of the head pale rufous, forehead more rufous, the hairs being brown at the base with scattered white tips, which are also found on the dusky muzzle.

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[*] Eastern Persia, Vol. II, p. 41.

[†] Rüppell, Atlas, p. 15, Taf. 5.

The ears are grey outside with a slight rufescent tinge, white inside. In one specimen the ears are more dusky than in the other, which is shewn by the teeth of the skull to have been an aged animal. The hair of the body is soft and long, the longest hairs on the middle of the back being about 2 inches in length, with much fine under fur of a grey colour, dark ashy in one specimen, pale ashy in the other, the longer hairs on the back are black near the ends, the tips of many being white. On the anterior portion of the back in one specimen, the hairs are rufous between the grey base and the blackish tip, and the rufous colour extends along the back of the neck. This imperfectly marked rufous colour doubtless represents the chesnut stripe in *V. famelicus.* The gape and chin are dusky, the breast ashy grey, the abdomen white. The fore legs are pale rufescent in the older specimen, dusky grey in the younger, the hind legs rufous brown outside in the one animal, dusky black in the other, the tail is very bushy, the hairs grey or white with long black ends above and at the tip, so that the tail appears blackish except below, where it is white or nearly white. The skins are too much stretched for their measurement to be of any use, except in the case of the tail, which measures 15 to 16 inches ; of this the hairs at the end are about 2½ in. The measurements above given are founded on the skeleton.

The skull, which, as already mentioned, is that of an aged animal, is very small and almost destitute of crests. The hinder portion of the brain pan is much rounded and the small occipital crest very low on the back of the head, being in fact about equally distant from the *foramen magnum* and the top of the skull. The following are measurements of this skull :

	inches	metre
Length from occipital crest to anterior termination of premaxillæ, ...	3.65	·092
„ from anterior margin of *foramen magnum* to do., ...	3·35	·084
„ of suture between nasal bones, ...	1·12	·028
Breadth of nasal portion of skull at posterior termination of premaxillæ, ...	0·57	·014
„ of frontal region behind postorbital processes, ...	0·73	·018
„ of brain case where widest across parietal region, ...	1·4	·025
„ of skull across zygomatic arches, ...	2·02	·0505

Length of bony palate from anterior termination of premaxillæ to opening of posterior nares, (measured to end of small posterior projecting process in the middle of the palate,) ...	1·85	·047
Breadth of bony palate between penultimate molars (1st true molars,)	0·47	·012
Length of last upper premolar, ...	0·38	·0095
„ of 1st molar, ...	0·26	·0065
Breadth of do., ...	0·37	·009

Of the limb bones the humerus is 3·1 inches long, the radius 3, the femur 3·13, and the tibia 3·58.

P. S.—Since the preceding description of *Ursus Gedrosianus* was in type, Dr. Duke has written to the 'Pioneer' to say that he has received two imperfect skins of a 'Mamh' obtained near Quetta, and that they are black. It remains to be seen whether the black and brown bears of Baluchistan are varieties or distinct. The former is more probable.

XV.—*On an apparently new hare, and some other mammalia from Gilgit.* —*By* W. T. Blanford, F. R. S.

(Received and Read Novr. 7th, 1877.)

A small collection of mammals made in the course of last year by Captain Biddulph in the extreme north-western part of Kashmir was left by him in the Indian Museum, with a request that I would examine the specimens. The skins comprise a fox, an otter, a hare, a *Lagomys*, and a mouse.

The fox appears to me to be probably a form of *Vulpes montanus* in summer dress. A similar specimen was obtained by Captain Biddulph in Káshghar and made over by him to Dr. Stoliczka. The fur is very short; there being, in fact, scarcely anything but the underfur left, and even that is thin. Under these conditions the colour differs widely from that of *V. montanus* in its winter garb, and most skins are taken when the fur is in fine condition. The specimen is from Hanza (probably a place of that name N. N. E. of Gilgit), and was obtained at an elevation of 8000 feet. Another precisely similar, except that the ears were less black, was also procured.

In the skin before me, the face is rufous, deepest in front of the eyes, the ears sooty black outside, the middle of the back ferruginous with a brown tinge from the under fur, a very distinct rufous cross band on the shoulders, so as to form a marked cross on the back, and the sides of the body very pale. Lower parts dirty white. Tail not full, very woolly, (as is the fur generally,) slightly rufous above, elsewhere dirty white mixed with black hairs, the tail-tip white. Legs rufous externally with dark hairs intermixed.

The otter-skin unfortunately wants the skull, and it is impossible to determine it accurately. It has evidently belonged to a large form, approaching *Lutra vulgaris* in size, but it is much paler in colour. The upper parts are somewhat light brown, the under fur being very pale whitish brown at the base, then rich wood-brown, rather rufous, with numerous longer hairs mixed, which have whitish tips, giving a pale speckled appearance to the fur. On the lower parts the under fur is white at the base, then light brown, with long white hairs intermixed, so that the general colour is slightly sullied white. The whiskers are white. Sides of the head below the ears and eyes, chin, and throat rather whiter than the breast and abdomen.

This animal may belong to the Central and Northern Asiatic species, referred by various naturalists to *L. vulgaris*. The exact locality is not given, but the specimen was doubtless obtained on the upper Indus or one of its tributaries.

Of the mouse only a dried skin is preserved. The locality is marked 'Hunza 8000 feet,' and is probably the place already mentioned. I am unable to identify this skin with any known species: it closely resembles *Mus Bactrianus*, but appears distinguished by having the upper surface of the tail very much darker than the lower and by longer feet. The colour above is brown, below whitish, the tail dark brown above, pale isabelline below, feet whitish. The skin measures from nose to rump 2·6, tail very little above 2, tarsus without claws 0·75. I do not like to propose a new name on the amount of evidence before me. *M. Bactrianus* is said by Jerdon to have been sent from Kashmir, the only localities given by Blyth however are in the Panjab. I have since obtained this mouse from various parts of Sind, from Ajmere, where it has been found by Major St. John, and throughout many parts of Baluchistan and Southern Persia. It is possible that the Hanza mouse may be merely a variety.

The hare I am unable to identify with any known species and I therefore propose to name it from its discoverer.

LEPUS BIDDULPHI, sp. nov.

L. *minor, ad* L. Tibetanum, L. Pamirensemque *proxime accedens, supra pallide rufescens, pilorum apicibus nigris intermixtis, infra albus, caudâ superne nigrâ, uropygio cum dorso concolore, auribus mediocribus, apicibus ad marginem nigris, collo pectoreque pallide rufescentibus ; vellere molli, longiusculo, ad basin cinereo. Long. corii desiccati a rostro ad basin caudæ* 19, *caudæ cum pilis* 4·5, *tarsi* 5, *auris extus* 4·25 poll. Angl.

Hab. in Yassin (Gilgit) *provinciâ ad* Kashmir *pertinente, ultra flumen Indum jacente.*

The general colour above is rather pale rufous, with a dusky wash caused by the tips of the longer hairs being black. There does not appear, in the only skin I have examined, to be the grey rump of *L. Pamirensis* and several other Central Asiatic species. The forehead and central portion of the muzzle is pale rufescent grey, the hairs rufous ashy at the base, then brown, and isabelline at the tips. The sides of the head are paler, but a few black tips are found on the hairs of the cheeks. There is a pale ill-defined band on each side of the muzzle, including the eye. Whiskers black at the base, white towards the end; some wholly white. Anterior portion of the ears outside nearly the same colour as the forehead, hair soft, not so dense and harsh as in *L. Pamirensis*, posterior portion of outer surface pale rufous, extreme tip of ear black outside, the black running about a third of the way down the posterior edge. Neck all round and breast pale rufous, hairs ashy at the base and pale tipped, except on the nape. Fur of body soft, on the hinder part of the back the hair is about 1¼ inches long, and consists of coarser piles mixed with fine woolly under fur. Throughout the dorsal portion the hair is ashy at the base, then isabelline, followed by a brown ring, the end being pale rufous, except in the longest hairs, which are tipped black. Tail sooty black above. Limbs externally pale rufous. Underparts white.

The skull of *Lepus Biddulphi* differs from that of *L. Tibetanus* in the following characters. The parietals are broader and flatter, the width of the frontals greater and they are somewhat more convex just behind the post-orbital processes. The nasals are truncated behind, the angle formed by the junction of the posterior and exterior margins being a right angle as in *L. Stoliczkanus* and *L. Yarkandensis*, differing in this respect from *L. Tibetanus*, *L. Pamirensis*, and *L. hypsibius*. The hinder extremities of the premaxillæ are parallel with the hinder margin of the nasals, the jugal is narrower vertically. The muzzle is less high and the whole skull flatter. The palatal opening is smaller and differently formed behind. The opening of the posterior nares is narrower. The lower jaw is much less high.

The nearest approach to the skull of *L. Biddulphi*, amongst the species of which specimens are available for comparison, is made by the hare which inhabits the Karakash valley between Ladak and Yarkand. This species much resembles *L. pallipes* of Hodgson from the portion of Tibet north of Nepal and Sikkim. In the skull of the Karakash hare, however, the nasals extend backwards to some distance beyond the terminations of the premaxillæ, the zygomatic arch is broader and more convex beneath, the postorbital processes are differently shaped and the whole skull larger.

The skull, extracted from the skin, is imperfect behind, and the length cannot be measured. It was probably under 3½ inches. The following are some of the dimensions:

	In.	Met.
Length of suture between nasal bones,...........	1·23	·031
Greatest breadth across hinder portion of zygomatic arches, ...	1·6	·04
Breadth of brain case behind glenoid fossa, ...	1·17	·029
Breadth of frontal region where narrowest behind post-orbital processes, ...	0·57	·014
Breadth of nasals where widest near posterior termination,......................................	0·62	·016
„ „ at anterior end, ...	0·51	·013
Length of bony palate behind anterior palatal orifices,..	0·25	·006
Width of do. between anterior molars,...........	0·45	·011
Length of row upper molars, ...	0·61	·015
„ of lower jaw from angle to symphysis,...	2·25	·057
Height do. to condyle, ...	1·32	·033

The *Lagomys* I find somewhat difficult to determine. Captain Biddulpha has collected two specimens, one from the Gilgit district, obtained at an elevation of 10,000 feet, the other from the Kishengunga valley, at 7500 ft. On the whole these specimens appear to me to agree best with *L. auritus*, the species inhabiting the Indus valley in Ladak at moderate elevations, but the ears, so far as can be judged, are much smaller, scarcely exceeding in size those of *L. Roylei.* The dimensions however appear larger than those of *L. Roylei*, and the fur is much longer and softer. The colouration of the upper parts is greyish brown, the face being rufous to a variable extent, and there being in both skins a marked rufous patch below the ears, (the glandular patch noticed in skins of some species of *Lagomys* by Dr. Günther; Ann. Mag. Nat. Hist. Septr. 1875, Ser. 4, Vol. XVI, p. 230,) though this is evidently a variable character, for whilst in one skin, and this has the forehead less rufous than the other, the patch below the ear is ferruginous, and the breast, shoulders and flanks rufous, in the other skin the tinge is much fainter and is confined to the sides of the neck. The lower parts are white, faintly tinged with rufous in one specimen, the blackish basal portion of the hair shewing conspicuously.

The skull is very near that of both *L. auritus* and *L. Roylei;* from that of the former it only differs in having the nasals a little broader behind, and the orbits a trifle smaller, and from that of the latter by similar small differences. Neither the external characters nor the skull agree with *L. rufescens.*

The following is a summarized list of the species above discussed:

1. *Vulpes montanus.*
2. *Lutra,* either *L. vulgaris,* var. or an allied species.
3. *Mus,* probably new, allied to *M. Bactrianus.*
4. *Lepus Biddulphi,* sp. nov.
5. *Lagomys auritus?* var.

XVI.—*On a supposed new Sheep from the Central Hills of Kelat.*—*By* A. O. Hume.

(Received 30th October; Read 7th November, 1877.)

(With plate IV.)

I received last year from Major Sandeman, C. S. I., Political Superintendent of Kelat, the head and horns of a sheep which he supposed to be the same as the oorial (*Ovis cycloceros*) and which had been obtained in the Hills above the Bolan pass.

Directly I saw these horns I was struck with their greater length and slenderness, and their peculiar twist, and after comparing them with two specimens of *O. Vignei,* and numerous specimens of *O. cycloceros,* and the description of *O. Gmelini,* the head appears to me to belong to a hitherto undescribed species.

In all these three species, as far as I can make out, each horn lies in one plane, whereas in the present species the horn twists out, in a capital S. fashion. There is in fact much the same difference between the horns of the present species and of *O. cycloceros,* that there is between those of *O. Kareleni,* and *O. Hodgsoni.*

It seems to me not impossible that this species may be one at any rate of the wild stocks from which the domesticated breed originated.

I propose to name this sheep

OVIS BLANFORDI.

after my friend Mr. W. T. Blanford, our well known Zoologist and Geologist.

The following are the dimensions of the skull and horns with corresponding dimensions of those of a specimen of *O. cycloceros,* of apparently the same age, viz., about 8 years. In the case of each measurement, the dimension first given is that of *O. Blanfordi.*

Length from the occipital crest to the end of the premaxillaries,	10·25,	10·85
„ from the anterior border of the foramen magnum,	9·85,	8·55
„ of the bony palate from the opening of the posterior nares to the extremity of the premaxillaries,	4·7,	4·5
„ of the upper molar series,	2·6,	2·85
Breadth of palate between last molars,	1·63,	1·69
„ between anterior premolars,	1·13,	1·0
„ of the fossa between the pterygoid processes,	0·5,	0·75
Greatest width of skull at posterior border of orbit,	5·3,	5·6
Length of horns along the curve,	35·75,	29·5
Circumference of ditto at base,	9·0,	10
Width from tip to tip of horns in a straight line,	16·5,	5·4
Greatest breadth of horn at base,	2·25,	2·45
Greatest depth of horn at base,	3·25,	3·25
Width of forehead between orbits,	3·5,	3·8

The lower part of the forehead at the nasal suture and the whole of the frontals are more raised and convex than in either *O. cycloceros*, or *O. Vignei*.

The frontal ridge between the bases of the horns is less developed in *O. Blanfordi*, and in this latter the posterior convex margin of the bony palate is differently shaped, being more pointed and not nearly semicircular as in *O. cycloceros*.

Although this was promised me, I have not, I regret to say, as yet received any skin of this sheep; but I should hope that the dimensions above given, accompanied by an accurate drawing, would suffice to enable other observers to identify this supposed new species.

XVII.—*Catalogue of the recorded Cyclones in the Bay of Bengal, up to the end of* 1876, *compiled by* Henry F. Blanford, *Meteorological Reporter to the Gevernment of India.*

The following list was drawn up with a view to ascertaining with greater accuracy than had previously been practicable, what is the distribution of cyclones at the different seasons of the year, and also what parts of the Bay are most liable to storms, in each season of the year. The general results arrived at on these heads have been announced in my lately published work "The Indian Meteorologist's Vade Mecum."

The basis of the present catalogue has been furnished by the two lists published by Dr. Buist in Vols. xii and xiv, of the Transactions of the Bombay Geographical Society, and that given by Mr. Piddington in the Sailor's Horn Book,* accompanying a chart of the storm tracks. To these I have added a considerable number of storms, notices of which I have gathered from other sources, and also those recorded in recent years in the Reports of the Meteorological Department. A few evident errors in Dr. Buist's catalogues (possibly arising from misprints) have been corrected, and attention has been drawn to some doubtful cases.

The several authorities referred to are designated in the Catalogue by the following symbols :

B. I.	Buist's first catalogue. Trans. Bombay Geog. Soc. Vol. xii. App. A.
B. II.	ditto second ditto ditto ditto ditto ditto xiv. p. 19.
P. I-XXV.	Piddington's Memoirs in Journ. As. Soc. Bengal.
PHB.	ditto Sailor's Horn Book of Storms.
AAR.	Asiatic Annual register.
O.	Orme's History of the Military transactions in Hindostan.
C.	Capper's Winds and Monsoons.
HID.	Horsburgh's Indian Directory. Taylor's Edit. 1874.
G. & T.	Goldingham and Taylor. Madras Met. Register 1822-1843.
SGMA.	Surveyor General's Meteor. Abstracts for Calcutta 1840-77.
MJ.	Madras Journal.
L.	Dr. Liebeg in the J. As. Soc. Bengal 1858.
PRS.	Proc. Royal Soc. London.
BMR.	Bengal Meteorological Reports.
G. & B.	Gastrell and Blanford. Report on Calcutta Cyclone 1864.
W. Rep.	W. G. Willson's Special Reports on Cyclones.
E. Rep.	J. Eliot's ditto ditto ditto.
Auct.	The Author from private notes.
AJ.	Asiatic Journal.
T.	Col. Thuillier in Journ. As. Soc. Bengal. Vol. xvii. p. I.

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* Also in Vol. xvi, part 2 of the Journal of the Asiatic Society of Bengal.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
I	1737	Oct.	7th	A violent earthquake and furious hurricane at the mouth of the Ganges; reached 60 miles up the river. 20,000 craft of all descriptions destroyed. 300,000 people said to have perished in Lower Bengal or in the Gulf. The river rose 40 feet above its usual level.*	PHB. p. 225.
II	1747	Oct.	2nd	Six French men of war blown out of Madras roads by a hurricane; one foundered and 4 dismasted. Twenty other vessels driven ashore or lost at sea. Storm not felt at Pondicherry.	O. C. p. 57. B. I.
III	1749	Apl.	13th	A furious hurricane on the Coromandel Coast. English camp at Porto Novo blown down. Two Indiamen stranded. The *Apollo* hospital ship, *Pembroke* 60 guns, and *Namur* 74 lost.	O. C. p. 62.
IV	1752	Oct.	31st	Violent hurricane on the coast of Madras. Rain that fell continuously for several days laid the whole country under water.	O. C. p. 58.
V	1760 1761	Dec. Jan.	31st & 1st	Cyclone at Pondicherry during the siege. Central calm passed over the town at midnight of New Year's eve.	O. C. p. 58.
VI	1763	Oct.	21st	Madras. All vessels at anchor in the roads lost.	C. p. 59.
VII	1768	Oct.	29th	Madras. *Chatham* Indiaman lost in the roads. Storm not felt at Pondicherry.	C. p. 60.
VIII	1782	Oct.	20th	Madras. More than one hundred country vessels stranded.	HID.
IX	1787	May	19th & 20th.	Great storm and storm wave inundation at Coringa; penetrated 20 miles inland. Estimated that 20,000 souls and 500,000 cattle perished.	AAR. *h*788. PHB. p. 195. B. I.

* These estimates are in all probability greatly exaggerated, as will readily be believed by any person acquainted with the character of Indian statistics, even at the present day. The loss of life in the Backergunge cyclone of November 1876, was eventually found to be only about half the original estimate, although this latter was based on an actual enumeration of a certain number of villages, and had been framed with comparative caution.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
IX	1789 ?	Dec.	?	A great storm wave inundation at Coringa. Accounts collected by M. de la Place in 1840. [Perhaps the same as the preceding. H. F. B.]	PHB.
X	1792	Oct.	26th & 27th.	At Madras. No details given.	B. I.
XI	1797	June	18th to 20th.	At Madras. No details.	B. I.
XII	1797	Nov.	?	In north of Bay. Recorded by H. C. S. *Minerva*.	PHB.
XIII	1800	Oct.	19th.	Furious hurricane and earthquake at Ongole and Masulipatam. Many houses at Ongole shaken down.	B. I. PHB. p. 226.
XIV	1800	Oct.	28th.	Hurricane at Coringa and Masulipatam.	B. I. PHB.
XV	1803	Dec.	4th.	H. M. S. *Centurion* experienced a violent hurricane between Trincomalee and Madras.	HID.
XVI	1805	Jan.	7th.	At Trincomalee and on Coromandel Coast and across peninsula to Tellicherry on the Malabar Coast.	AAR. 1808. B. I.
?	1805	Mar.	16th.	Calcutta and Lower Bengal [Doubtful if this were a cyclone from the Bay. H. F. B.]	B. I.
XVII	1807	Dec.	10th & 11th.	Madras. The sea breached the fort and walls of the Black town. Storm not felt to north of Pulicat, nor at Pondicherry.	B. I. HID. AAR. x. 129.
XVIII	1808	Sept.	5th & 6th.	Cyclone at Vizagapatam. 20 country ships driven on shore.	AAR. x. 153.
?	1808	Dec.	12th.	Madras and South Coromandel Coast. Great loss of life and shipping. [Probably a mistake, being a repetition of XVII H. F. B.].	B. I.
XIX	1811	May	3rd.	Madras. Destroyed nearly every vessel in the roads. Ninety native vessels wrecked. The *Dover* frigate and store ship *Manchester* run ashore and wrecked.	B. I. HID.
XX	1818	Oct.	23rd & 24th.	Madras. Centre of cyclone passed over the town.	B. I. AJ. May 1819.
XXI	1820	Mar.	29th & 30th.	Madras [and Kistnapatam ?]	B. I. PHB. p. 55.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
XXII	1820	May	8th.	Madras and also on Malabar coast. Occasioned some loss of shipping south of Bombay.	B. I. PHB. p. 56, 95.
XXIII	1822	June	?	Storm wave swept over Burisal and Backergunj. 50,000 souls said to have perished. Storm travelled only 53 miles in 24 hours.	B. I. PHB p. 56.
XXIV	1823	May	26th.	From the north of the Bay over Balasore. The *Liverpool* and *Oracabessa* storm. Six large ships wrecked.	B. I. PHB p. 56.
XXV	1823	June	2nd.	Chittagong and Delta of Ganges.	B. I.
XXVI	1824	June	8th.	Chittagong. Heavy inundations causing immense loss of life and property.	B. I. P. XXII.
XXVII	1827	May	7th to 10th.	Madras. Several native vessels driven on shore, and the *David Scott* parted her chain cables. Lowest bar. at Madras 29·76.	G. & T.
XXVIII	1830	May	26th.	Cyclone apparently passed at sea northwards. A fresh or light gale at Calcutta. Lowest bar 29·008.	T.
XXIX	1830	Dec.	2nd.	A gale of the most violent description at Pondicherry and Cuddalore, whereby the stoutest trees were laid low, houses unroofed and many lives lost. At Madras, wind approached to a gale at 8 or 9 P. M.	G. & T.
XXX	1831	Oct.	31st.	Balasore and Cuttack. Inundation swept away 300 villages and at least 11,000 people. Famine followed and total loss of life estimated at 50,000 souls.	B. I. PHB. p. 56. AJ. 1832 & 1833.
XXXI	1831	Dec.	6th.	Pondicherry and Cuddalore. Lasted a few hours only but fearfully destructive.	B. I.
XXXII	1832	May	21st.	In Gangetic delta 8000 or 10,000 people drowned.	B. I.
	1832	Aug.	4th.	Furious hurricane at Calcutta. Bar. 28·8 [not mentioned in Col. Thuillier's list of storms at Calcutta; possibly an error for that of 3rd August 1834. H. F. B.]	B. I.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
XXXIII	1832	Oct.	7th.	A fresh or light gale at Calcutta.	T.
XXXIV	1833	May	21st.	At mouth of Hooghly. H. C. S. *Duke of York* stranded on a paddy field 2¼ miles south of Hidjillee. Bar. at Calcutta 29·032. Storm did not reach to Balasore.	TB. I. PHB p. 56, 273.
XXXV	1834	May	?	At Khyouk Phyoo on Arakan coast.	PHB.
XXXVI	1834	Aug.	3rd.	At Calcutta blew a gale with incessant rain. Bar. 29·028. Rain 5·30 ins.	T.
XXXVII	1836	Oct.	30th.	Madras. Central calm passed over the town and lasted a quarter of an hour. Lowest bar. 28·285.	G & T. B I. PHB. p. 56.
XXXVIII	1838	Oct.	19th.	At Kedjiri in the Hoogly estuary. Bar. at Calcutta 29·398.	T. [56. PHB. p.
XXXIX	1838	Nov.	?	At Khyouk Phyoo.	PHB. p.
XL	1839	June	3rd to 5th.	Traversed the top of the Bay from ENE to WSW. ? [This course seems very doubtful. On the data given, I should put the centre on the 3rd and 4th in positions very different from those adopted by Mr. Piddington. The course was more probably from SE to NW to near Pooree. Prof. Dove has been misled by the original error. See Klimat. Beitr. i. p. 213. H. F. B.]	P. I. [56.
XLI	1839	Sept.	19th to 21st.	Passed northward across Sunderbuns, between Calcutta and Burrisaul, to near Rungpore. Lowest bar. at Calcutta 29·200 with N. wind.	P. II. T.
XLII	1839	Nov.	12th to 17th.	Across the Bay from the Andamans to Coringa. A storm wave laid the shore 8 ft. under water. 70 vessels and 700 souls lost at sea. 6,000 said to have been drowned on shore.	P. II. B. I.
XLIII	1840	April May	27th to 1st.	Andamans to the Orissa coast. Felt at Calcutta, where lowest bar. was 29·42. Centre passed just South of Pooree.	P. III. B. I. T. I.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
XLIV	1840	May	?	Hurricane off Madras and Southern coast.	B. I.
XLV	1840	Nov.	21st.	To the NE of Andamans.	P. II.
XLVI	1841	May	16th.	From the SW of the Andamans to Madras. A lull in the middle of the storm at Madras Bar. 29·069.	P. V. G. & T. B. I.
XLVII	1842	May June	31st to 5th.	Great Calcutta cyclone on 3rd June. "The most severe gale ever felt at Calcutta." Bar. 28·278. Centre passed over the city.	P VIII. T. SGMA. B. I.
XLVIII	1842	Oct.	2nd to 5th.	Across the north of the Bay, in a NW direction to Cuttack. Also felt at Gya and Patna on the 6th.	P IX. B. I.
XLIX	1842	Oct. Nov.	22nd to 1st.	From the Andamans westward to Pondicherry and across India to the Arabian Sea. Thence westward to E. Long. 60° a total course of 2000 miles. Average rate of travelling 12·4 miles per hour across the bay, and 5·6 miles afterwards.	P VIII. B I.
L	1843	May	19th to 23rd.	From South of bay, NW to Ongole. Bar. at Masulipatam 28·73. The place inundated by the sea. Bar. at Bombay fell 0·2 from 18th to 23rd.	P X.
LI	1843	Nov. Dec.	28th to 2nd.	From N. lat. 6° E. long. 90° in NW direction. Did not reach land. Another storm simultaneously in lat. 7°—8° and same long, south of the equator.	P XI.
LII	1844	May	11th.	Noakhally and Chittagong.	P XII.
LIII	1844	Aug.	21st.	Blowing a gale at Calcutta from 9 P. M. to the following morning. More than 12 ins. of rain fell. Bar. at sunset, before the gale 29·350. [Not mentioned by Piddington but appears to have been a cyclone. H. F. B.]	T. SGMA.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
LIV	1844	Nov.	9th to 14th.	East of the Andamans. Encountered by the *Briton* and *Runnymede* troop ships. Both dismasted and thrown on Andamans.	P. XII.
LV	1845	Nov. Dec.	29th to 2nd.	From South of bay, westward to Ceylon. Centre passed near Batticuloa. On the 3rd a magnetic storm observed at Bombay.	P. XIV. B. I.
LVI	1846	Sept.	21st.	A gale at night at Calcutta. Bar. at sunset before gale 29·475.	T. SGMA.
LVII	1848	April	23rd.	Violent hurricane off Ceylon, in which H. M. brig *Jumna* was nearly lost.	B. I.
LVIII	1848	July	15th.	Sandheads. Ship *Nussur* foundered.	P. XXII.
LIX	1848	Oct.	12th to 14th.	In north of Bay where it was generated. Travelled NW to False Point. Centre passed over light-house.	P. XVIII.
LX	1849	May	12th to 13th.	Chittagong. Lowest (unsed) Bar. 28·40.	P. XXII.
LXI	1849	Dec.	10th.	Severe hurricane at Madras. Ships *Lady Sale*, *Industry* and *Princess Royal* lost.	B. I.
LXII	1850	April	23rd to 28th.	Cyclone formed to west of Nicobars passed northward to Bengal, between Midnapore and Calcutta and over Moorshedabad, on nearly the same track as that of 1864, but a little more westerly.	P. XX.
LXIII	1850	Nov.	17th to 19th.	In Andaman Sea. Formed east of Port Blair and travelled NNW.	P. XXII.
LXIV	1850	Dec.	4th.	Hurricane at Madras. Two ships and 18 country craft wrecked.	B. I.
LXV	1851	April May	30th to 6th.	From the NE of Ceylon to Madras Passed to north of town. Lowest bar. 29·322 with wind from SW.	P. XXI. B. I.
LXVI	1851	Oct.	20th to 23rd.	In north of Bay. Centre passed over False Point light-house and thence NE by N. in direction of Dacca. Lowest bar. at False Point 28·21.	P. XXIII. B. I.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
LXVII	1852	May	12th to 15th.	From lat. 15° course due North to Sunderbuns. Centre passed 39 miles East of Calcutta. Two river steamers in Sunderbuns carried to middle of jungle. Much damage in Calcutta.	P. xxiv. B. i.
LXVIII	1853	Mar.	26th to 28th.	Furious hurricane in Southern India. Some 50 vessels sunk or wrecked on the Coromandel coast, South of Madras.	B. i.
LXIX	1854	April	21st to 23rd.	A violent hurricane in Gulf of Martaban and at Rangoon.	P. xxv. B. i.
LXX	1854	Oct.	6th.	Hurricane South of Ceylon.	B. i.
LXXI	1855	May	15th to 29th.	Bay of Bengal between Burmah and Madras.	B. ii.
	1856 . ?	May	14th.	In Bay of Bengal. [This rests on Buist's authority only. A gale is recorded at Calcutta on this day, but it was only a violent hail-storm. H. F. B.]	B. ii. SGMA.
LXXII	1856	Sept.	3rd.	Calcutta. Lowest bar. 29·156.	SGMA.
LXXIII	1856	Nov.	17th to 21st.	Bay of Bengal 5° to 20° North. Felt at Madras.	B. ii. MJ. 1856
LXXIV	1857	Oct. Nov.	28th to 2nd.	Off Ceylon. Central calm passed over Nellore. Many houses and trees blown down.	B. ii. MJ. 1857.
LXXV	1858	April	9-10th.	From Andamans to Cape Negrais. Much destruction at Henzada and Rangoon, between which the centre passed.	L. B. ii.
LXXVI	1858	May	15th to 20th.	Bay of Bengal across to Malabar coast. Also Chittagong at Dacca.	B. ii.
LXXVII	1858	Oct.	25th & 26th.	At Calcutta. Lower bar. 29·291.	B. ii. SGMA.
LXXVIII	1859	April	21st to 27th.	Bay of Bengal and also the Andaman Sea. Prevailed with greatest violence in the neighbourhood of Negapatam. 15 to 20 inches rain over Tanjore.	B. ii. MJ. iv.
LXXIX	1859	June	12th to 17th.	Bay of Bengal off Akyab.	B. ii.
LXXX	1859	July	25th to 27th.	Calcutta. Lowest bar. 28·179. Incessant rain. No thunder or lightning.	B. ii. SGMA.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
LXXXI	1864	Oct.	2nd to 5th.	From NW of Andamans to Bengal. Storm wave in Hooghly swept away 48,000 souls and upwards of 100,000 cattle. Nearly all the shipping in the river stranded. P. and O. mail steamers *Bengal* and *Bentinck* hulk landed high and dry on fields. All trees stripped of their leaves. Lowest bar. at Calcutta 28·570,	G. & B.
LXXXII	1864	Oct.	25th.	North of Bay of Bengal.	G. & B.
LXXXIII	1864	Nov.	5th.	Masulipatam Cyclone.	G. & B.
LXXXIV	1865	Nov.	?	E. of Ceylon.	G. & B.
LXXXV	1867	Sept.	30th.	Vizagapatam Cyclone.	Auct.
LXXXVI	1867	Oct. Nov.	27th to 2nd.	From near Nicobars to Bengal. Passed East of Calcutta over Port Canning.	BMR. PRS.
LXXXVII	1867	Nov.	12th.	In north-east of bay.	Auct.
LXXXVIII	1868	Nov.	?	Cyclone at Akyab.	Auct.
LXXXIX	1869	May	1st.	In NE of Bay. *Moulmein* steamer involved.	BMR. 1869.
XC	1869	May	13th to 17th.	From Cape Negrais to NW across Bengal.	BMR. 1869.
XCI	1869	June	5th to 10th.	North of Bay and across Bengal.	BMR. 1869.
XCII	1869	Oct.	7th & 8th.	From NE of bay, across Midnapore, Purulia and Gya to Benares.	BMR. 1869.
XCIII	1870	Jan.	10th & 11th.	South of bay, midway between Ceylon and Nicobars.	BMR. 1870.
XCIV	1870	May	30th.	In NE of bay. Encountered by steamer *Moulmein.*	BMR. 1870.
XCV	1871	?	?	Near Pondicherry.	BMR. 1871.
XCVI	1872	April May	29th to 3rd.	Severe cyclone passed over Madras. Formed about 7° 30′ N. lat. Felt at Calicut and affected the barometer at Bombay.	BMR. 1872.
XCVII	1872	June July	28th to 1st.	A small storm generated in the north of the bay passed over Balasore.	W. Rep. BMR. 1872.
XCVIII	1872	Sept.	11th.	A small local cyclone in NE of Bay.	BMR. 1872.
XCIX	1872	Sept.	19th & 20th.	From north of bay, northwards across Jessore.	BMR. 1872.
C	1872	Oct.	24th to 26th.	Cyclone passed over Narcondam island levelling the forest.	BMR. 1872.

No.	Year.	Month.	Days.	Details of Storm.	Authority.
CI	1873	Nov.	3rd.	Severe cyclone encountered by the *Foam* in N. lat. 15° 30′, E. long. 85°.	BMR. 1873.
CII	1874	May	3rd to 5th.	Cyclone at Madras. Originated about N. lat. 9°, E. long. 85°. Broke up before reaching land.	BMR. 1874.
CIII	1874	June	15th to 17th.	Small cyclone in NW of bay.	BMR. 1874.
CIV	1874	July	28th & 29th.	An incipient cyclone in NW of bay.	BMR. 1874.
CV	1874	Aug.	1st & 2nd.	Crossed the north of the bay from near Akyab to WNW.	BMR. 1874.
CVI	1874	Oct.	13th to 16th.	Originated between 13° and 17° N. lat. Crossed to NW of bay and passed over Midnapore and Burdwan. Bar. at Sandheads in central calm 27·58.	W. Rep. BMR. 1874.
CVII	1874	Oct.	24th to 26th.	Cyclone felt at Coconada.	BMR. 1874.
CVIII	1874	Nov.	1st & 2nd.	Second cyclone at Coconada. Did not reach land.	BMR. 1874.
CIX	1874	Nov.	10th to 12th.	Encountered by Meinam between lat. 17° and 19.°	BMR. 1874.
CX	1874	Dec.	10th to 12th.	Storm in the South of the bay.	BMR. 1874.
CXI	1876	Oct.	5th to 8th.	Vizagapatam cyclone. Found to West of Andamans in N. lat. 15°, reached Vizagapatam on 8th and passed up the margin of East	J. E. Rep.
CXII	1876	Oct. Nov.	29th to 1st.	The Backerganj cyclone. Formed near Andamans and moved north to mouth of Megna, the islands of which were swept by storm wave, and upwards of 100,000 people drowned.	J. E. Rep.

XVIII.—*Memorandum on the diurnal Variation of Atmospheric Pressure at the Sandheads, by* Chas. Harding, Esq., *with a prefatory note by* Henry F. Blanford.

In the Society's Journal, Part II, No. 1 of 1877, I published a short paper on the Variation of the Barometric Tides in connection with the Diurnal Land and Sea-breezes, in which the diurnal variation of pressure over the Bay of Bengal between latitude 20° and the Sand-heads, in the month of January, was deduced from the ship observations recorded in the log-books collected by the London Meteorological Office. The method pursued in dealing with these observations was a very rough one, and by no means the best that might have been adopted; and I assumed (what I now admit was not justified) that the observations dealt with were sufficiently numerous to yield mean values for each hour of observation which should be comparable with each other.

A few weeks ago I received from Captain H. Toynbee, the Superintendent of Marine Meteorology in the London Meteorological Office, the following Memorandum, which was drawn up at his request by Mr. Chas. Harding, and as it furnishes an important correction to the results given in my paper above referred to, I have much satisfaction in communicating it to the Society.

H. F. B.

In glancing through Mr. Blanford's paper on the Variation of the Barometric Tides in connection with diurnal land and sea-breezes I was much struck by the diagram on p. 48, which shows the afternoon minimum, deduced from the sea observations, to be considerably less marked than the morning minimum; and from para. 2, p. 47, I gather that the pith of the paper depends greatly upon the shallowness of this afternoon minimum.

The discussion of the diurnal range of barometer observations at sea, in the neighbourhood of the equator, in the North Atlantic, (see Official No. 20, published by the Meteorological Office) in no way supports this excess of depression in the morning minimum, and the experience derived from that discussion has suggested to me a probable cause of much of the difference exhibited by Mr. Blanford.

I rather fail to reproduce the mean results given by Mr. Blanford, but I see sufficient to warrant me in inferring that whatever observations he has allowed to enter into the discussion have been summed up as follows: if the part of the ocean under discussion yielded sixty-four noon observations, thirty-eight 4 P. M. observations, &c., the sixty-four noon observations were meaned and the mean compared with the mean of the thirty-eight 4 P. M. observations.

I have quite ignored that I might refer to the original logs, and have considered myself restricted to the observations as given in the "Data

43

Books" and have dealt with the observations obtained from that source in a manner which as far as I can see is open to very little objection, and which is probably the best possible method under the circumstances.

I have meaned all the noon observations for an absolute reading, and for the means of the other 4-hourly periods have worked on the absolute differences which are obtainable from the various observations recorded: for example, working all the obtainable differences of 4 P. M. observations on noon observations for the same day, and finally meaning these differences, and applying the mean difference to the noon mean already obtained for a 4 P. M. mean:—so on for all the other 4-hourly periods. The method has been to take noon as a centre and work on differences at each side of it. The midnight observation has thus been obtained, by working backwards and forwards from noon, and the difference of the two results is only ·002 in.

The results for the 4-hourly periods are as follows, using all the sea data between 20° and 22° N. and 80° to 90° E.

4 A. M.	8 A. M.	Noon.	4 P. M.	8 P. M.	Midt.	Mean.
29·996	30·056	30·041	29·987	30·029	30·024	30·022
—·026	+·034	+·019	—·035	+·007	+·002	diff. from Daily M.

I have computed Bessel's constants from the 4-hourly values, and the expression is as follows:—

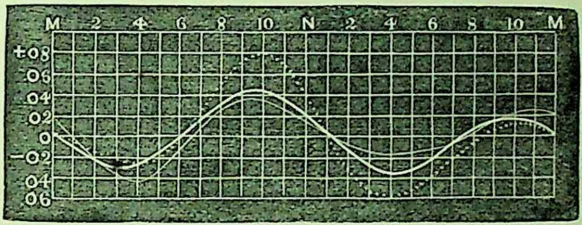
$$x = 30{\cdot}022 + {\cdot}0136 \sin (n.\,15° + 320°\,5') + {\cdot}0311 \sin (n.\,30° + 160°\,42')$$
$$+ {\cdot}0002 \sin (n.\,45° + 90°).$$

From the constants, the following hourly values for the sea observations have been computed: they are given side by side with the hourly values of sea observations deduced by Mr. Blanford and with those of Calcutta.

Hour.	Calcutta.	Sea [C. H.]	Sea [Mr. Blanford.]
	30·011	30·022	30·022
Midt.	+ ·003	+ ·002	+ ·016
1 A. M.	— ·006	— ·011	— ·001
2 „	— ·015	— ·023	— ·021
3 „	— ·021	— ·028	— ·037
4 „	— ·024	— ·026	— ·042
5 „	— ·020	— ·016	— ·033
6 „	— ·005	·000	— ·013
7 „	+ ·021	+ ·018	+ ·010
8 „	+ ·050	+ ·034	+ ·028
9 „	+ ·072	+ ·043	+ ·037
10 „	+ ·078	+ ·043	+ ·035
11 „	+ ·062	+ ·035	+ ·024

Noon	+ ·032	— ·019	— ·011
1 P. M.	— ·002	·000	— ·001
2 „	— ·031	— ·018	— ·010
3 „	— ·048	— ·031	— ·014
4 „	— ·054	— ·035	— ·016
5 „	— ·051	— ·031	— ·016
6 „	— ·040	— ·021	— ·014
7 „	— ·024	— ·007	— ·008
8 „	— ·007	+ ·007	+ ·002
9 „	+ ·006	+ ·016	+ ·014
10 „	+ ·012	+ ·018	+ ·023
11 „	+ ·010	+ ·013	+ ·024

The above observations are plotted in the following diagram.



Thick line—Sandheads. (C. H.)
Thin „ do. (H. F. B.)
Dotted „ Calcutta.

I have worked the values of the 4-hourly periods for the belts of latitude, from 20° to 21° N. and 21° to 22° N., as well as the combined result, consequently give them below.

4 A. M.	8 A. M.	Noon.	4 P. M.	8 P. M.	Midt.	Mean.	
30·005	30·063	30·047	29·991	30·033	30·025	30·027	20° to 21° N.
— ·022	+ ·036	+ ·020	— ·036	+ ·006	— ·002	Diff. from Daily Mean.	
29·977	30·031	30·021	29·973	30·013	30·013	30·005	21° to 22° N rejecting exceptional reading—·158.
— ·028	+ ·026	+ ·016	— ·032	+ ·008	+ ·008	Diff. from Daily Mean.	

The main reasoning of Mr. Blanford's paper is only affected in so far as the amount of difference, on which the reasoning is based, is considerably lessened.

I venture the above remarks as I gather from Mr. Blanford's paper that he intends eventually dealing with the other months in a similar manner.

The results given by me have not been thoroughly checked for want of time.

London, 9th October, 1877. CHARLES HARDING.

XIX.—*Notes on* Phasmidæ.—*By* J. WOOD-MASON.

(With Plates II and III.)

MENAKA SCABRIUSCULA.

Bacillus scabriusculus, Wood-Mason, J. A. S. B., 1873, Vol. xlii, pt. ii, p. 55, pl. viii, fig. 1, ♀.

Stheneboca Brunneri, Stäl, Recensis Orthopt. III, 1875, p. 69, ♀.

Menaka scabriuscula, Wood-Mason, MS.

I have seen numerous examples of this species in boxes of insects from Silhet, the locality given by M. Stäl for his species; but none of them differed sufficiently from those described by me to merit distinction even as a variety.

It is an insect with short and filiform antennæ, and as it differs in this as well as other respects from all the forms with which it has been classed by M. Stäl, I here introduce the new generic name that I had proposed for it.

LONCHODES WESTWOODI.

Bacillus Westwoodi, Wood-Mason, J. A. S. B., 1873, Vol. xlii, p. 51, pl. v, figs. 1, 2; P. A. S. B., 1873; p. 149; and Ann. and Mag. Nat. Hist., 4th Ser., 1873, Vol. xii, p. 348.

Lonchodes Westwoodi, id., J. A. S. B., 1875, Vol. xliv, p. 215, ♂.

Entoria spinicornis, Stäl, Recensis Orthopt. III, 1875, p. 72.

M. Stäl's* *Entoria spinicornis* from Silhet appears to me to be identical with the species described by me from the Andamans. I have since found it in abundance in Calcutta, and have ascertained that it occurs also in Silhet and on Camorta Is., Nicobars.

I have made a number of interesting observations on its habits and anatomy which will be published in due course.

It lives on *Streblus asper*, a shrub or small tree which is indigenous wherever the insect is found.

BACTERIA SHIVA, Pl. II, Fig. 3, ♂.

Bacteria Shiva, Westwood, Monograph of *Phasmidæ*, 1859, p. 32, pl. viii, fig. 6, ♀.

HAB. Westwood gives "North India" as the locality of the female preserved in the National Collection. Lt.-Col. Godwin-Austen has obtained several specimens of both sexes at Shillong, in the North Khasi Hills, and has thus enabled us to give a more precise locality for the species.

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* I take this opportunity of thanking M. Stäl for his friendly transmission of copies of all his memoirs on the *Orthoptera*, including his new '*Systema Phasmidarum*' which, on my return to India, I shall take an early opportunity of comparing with my own materials.

I now give a figure of the male, which was unknown to Westwood, but am obliged to reserve my description of it for a future paper.

The species in both sexes runs so very close to a winged species (apparently a variety of *Necroscia Sparaxes*, Westw.) from the same region that it now occurs to me that it may after all be nothing more than an apterous form of it.

BACTERIA SINKIEBENSIS, n. sp.

♂ ♀. Differs from *B. Sarawaka*, Westw. ♂ ♀ chiefly in the relative proportions of the different parts of the body.

The following are the measurements of dried specimens of the male and female :—

♂. Total length 32 lines ; head 1·75 ; proth. 1·75 ; mesoth. 8·75 ; metath. 4 ; abd. 13·25 + 3 = 16·25 ; antennæ 28·5.

♀. Total length 3 in. 6 lines ; head 2·5 lines ; proth. 2·25 ; mesoth 10·75 ; metath. 4·25 ; abd. 18·5 + 3 = 21·5 ; antennæ 31·25.

HAB. Sinkieb (Sinkep ?) Island, near Linga Island, off the N. E. coast of Sumatra, a male and a female taken *in copulâ* by my native collector.

LONCHODES AUSTENI, Pl. III, Fig. 4, ♂.

Wood-Mason, J. A. S. B., 1875, Vol. xliv, p. 216, ♂.

HAB. Dikrang valley, Assam.

I have nothing to add to my original description.

RHAPHIDERUS CERBERUS.

Anisomorpha ? Cerberus, Westwood, Monograph of *Phasmidæ*, p. 19, pl. I, fig. 6, ♂.

A spirit-specimen of the male, the only sex at present known, measures :—

♂. Total length 2 in. 2·25 lines ; head 2·5 ; proth. 2 ; mesoth. 4·75 ; metath. 2·75 ; abd. 9·5 + 4·75 = 14·25 lines.

HAB. Pusalava, Ceylon (*H. Nevill*).

I place the species provisionally in the genus *Rhaphiderus*, because it not nearly approaches *R. scabrosus*, with which it also agrees in its highly polished integument.

LONCHODES NEMATODES.

Phasma (Bacteria) nematodes, De Haan, Orthopt. Orient. p. 133, pl. xi, fig. 6, ♂, *nom.* pl. xiii, fig. 1, ♀.

Lonchodes nematodes, Westwood, Monograph of *Phasmidæ*, p. 42, ♂ only pl. v, fig. 7, ♂.

HAB. Buitenzorg in Java, and Sumatra (♂ *De Haan*); Singapore (♂ Westwood); and Perak, Malay Peninsula, whence I have just obtained for the Indian Museum a specimen of the male agreeing in every respect except size, as to which it is slightly inferior, with the specimen in the British Museum from Singapore figured by Westwood; it was purchased from a collection of insects formed by one of the medical officers attached to the Perak Expedition.

LONCHODES BREVIPES.

Lonchodes brevipes, G. R. Gray, Syn. Phasm. p. 19, ♂
„ *pterodactylus*, id., op. cit. p. 19, ♀.
Phasma (Bacteria) nodosum, De Haan, Orthopt. Orient. p. 133, pl. xi, fig. 3, ♂.
„ *Sumatranum*, id., op. cit. pl. xiii, fig. 6, ♀.
Lonchodes brevipes, Westwood, Monograph of *Phasmidæ*, p. 36, ♂ ♀.
„ *nodosus*, id., op. cit. p. 37, ♂ ♀.

I have carefully examined and measured the typical specimens of Gray's species preserved in the National Collection, but failed to detect the slightest difference between them and De Haan's species, of which a multitude of specimens of both sexes was obtained some years ago by my native collector at Johore* in the Malay Peninsula and on the island of Singapore immediately opposite. The specimens described by De Haan were from Sumatra, those by Gray from the Malabar Coast. I have also a specimen of the female presented to me by my late friend Dr. Stoliczka, which was said by him to have been brought from Java.

The following are the measurements of two of the typical specimens preserved in the British Museum with Gray's own names and the locality (Malabar) still attached to them :—

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* Similarly, the metallic coloured *Mantis*, of which my native collector obtained numerous examples at this same place, has proved identical with the species (*Metalleutica splendida*) described many years ago by Westwood from Malabar. The species, like so many other metallic insects (*e. g.*, notably *Chiloloba acuta*, of which fiery red with all the fire of the opal, green, and blue specimens, with all connecting shades, can be collected at Sahibganj in a few minutes; *Heterorrhina elegans*, and other *Cetoniidæ*,) exhibits the phenomenon of dichroism, the blue (*M. violacea*) being structurally perfectly indistinguishable from those that are green with coppery reflections (*M. splendida*). To place the matter beyond all doubt I submitted specimens of each form for comparison with the type to Professor Westwood, who also was unable to detect any difference between them save that of colour.

The larvæ are all coloured, as to their legs and bodies, like the blue form of the imago, thus exhibiting, as appears to me probable, an ancestral phase; and if this be so, then the dimorphism would in this case, at any rate, be interpretable as the retention, throughout life, of larval, that is, ancestral, characters by certain individuals of both sexes; and this may be the true nature of dimorphism in insects in general. But we are as far as ever from understanding what profit or advantage it can be to a species to exist under two or more different forms.

♂. Total length 4 inches ; head 1·75 : prothorax 1·75 : mesothorax; 13 ; metathorax 9·25 ; abdomen 17·75 + 5 = 22·75 (*L. brevipes*).

♀. Total length 4 inches 9 lines ; head 3 ; proth. 2·25 ; mesoth. 13·25 metath. 10·5 ; abdom. 22·5 + 6 = 28·5 (*L. pterodactylus*).

The following those of a male and a female from Johore and both preserved in alcohol :—

♂. Total length 4 in. 1·5 lines ; head 1·75 ; proth. 2 : mesoth. 13·25 ; metath. 10 ; abd. 18 + 4·75 = 22·75 ; antennæ 28·25 lines.

♀. Total length 5 in. 6·25 lines ; head 3 ; proth. 2·5 ; mesoth. 15·25 ; metath. 11·75 ; abd. 27 + 6·75 = 33·75 ; antennæ 23·25 lines.

And the following those of the female from Java—also preserved in alcohol :—

♀. Total length 4 in. 6 lines ; head 2·5; proth. 2·25 ; mesoth. 11 75 ; metath. 9·25 ; abd. 22·5 + 5·75 = 28·25 ; antennæ 16·5 lines.

The males in this species have the metathorax curiously curved and in both sexes this segment is so articulated to the mesothorax on each side by interlocking processes as to be capable of movement upwards and forwards upon it through an arc of fully 45°—peculiarities of structure which have not been met with by me in any other species of the family. The highly indurated condition of the whole thoracic integument is also exceptional.

LONCHODES SPINICOLLIS.

Prisomera spinicollis, G. R. Gray, Syn. Phasmid., p. 16, ♀.
„ *spinicolle*, Westwood, Monogr. Phasm., p. 47, ♀.
? *Lonchodes auscultator*, Bates, Trans. Linn. Soc. Lond., Vol. xxv, p. 334, ♂.

The following are the measurements of a spirit-specimen :—

♀. Total length 4 in. 7·25 lines ; head 2·5 ; proth. 2·25 ; mesoth. 12 ; metath. 9·5 ; abd. 23 + 6 (to end of supra-anal plate) = 29 ; antennæ 30 lines.

HAB. Galagedara, near Kandy, Ceylon,* obtained by Mr. Hugh Nevill, of the Ceylon Civil Service.

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* The importance of exact habitats for species from Ceylon and S. India cannot be too strongly insisted on : I have, from both countries, species which must have lived in open parched country with but a scant covering of vegetation like that around Bangalore, Madras, &c., and species which equally certainly are inseparable from the thickest and most luxuriant tropical vegetation, all marked with no more precise locality than 'Ceylon' or 'S. India' or 'Madras.' Animals localized in this unprecise manner are all valuable enough as specimens of the species to which they belong, but they have no higher value.

The specimen agrees perfectly with the type in the British Museum, which however has lost the long and conspicuous supra-anal plate.

There can hardly be a doubt that Bates' *L. auscultator* is the male.

LONCHODES CRAWANGENSIS.

Phasma Crawangense, De Haan, Orthopt. Orient. pl. xiii, fig. 1 ♀ ; *non* pl. xi, fig. 6, ♂.

Lonchodes nematodes, Westwood, Monograph of *Phasmidæ*, p. 42, ♀.

A dried specimen of the female obtained by my native collector at Johore in the Malay Peninsula measures :—

♀. Total length 5 in. 2 lines ; head 2 ; proth. 2·25 ; mesoth. 15 ; metath. 11·5 ; abd. 27·5 + 3·75 (to apex of 10th segment) = 31·25 ; antennæ 26 lines.

An immature insect closely resembling the female in general structure, and doubtless the opposite sex of the species, was obtained by Mr. W. Davison at Pahpoon, N. of Moulmein : it measures :—

♂ *immature.* Total length 2 in. 10·25 lines ; head 1·5 lines ; proth. 1·5 ; mesoth. 7 75 ; metath. 6 ; abd. 15 + 3·25 = 18·25 ; antennæ 14·5.

PHIBALOSOMA ANNAMALAYANUM.

Phib. Annamalayanum, Wood-Mason, P. A. S. B., July, 1877, p. 161, ♀.

♀. Very closely allied to *Phib. acanthopus*, from which it differs in its stouter body, its shorter and thicker legs, and in the relative proportions of the different parts of the body, particularly the meso- and meta-thorax.

The following are the measurements of a spirit-specimen :—

Total length 8 inches 9 lines ; head 7 lines ; mesoth. 19 ; metath. 16 ; abd. 3 in. 6·75 lines + 1 in. 2·5 lines = 4 in. 9·25 lines ; antennæ 2 in. fore femur 2 in. 2 lines, tibia 2 in. 6 lines ; intermediate femur 1 in. 8 lines, tibia 1 in. 8 lines ; posterior femur 1 in. 11 lines, tibia 2 in. 1 line.

A lamellar process rounded off at extremity at hinder end of sixth ventral segment of the abdomen.

HAB. Annamallay forests, Southern India, a single specimen preserved in spirits, obtained by Colonel R. C. Beddome, and Travancore Hills, a much mutilated dried example, presented to me by Mr. F. Day.

A characteristically Malayan form ; in which, as in *Phib. virgea* and in *Phib. acanthopus*, the female is perfectly apterous, the metanotum proper is much longer than the medial segment, and there is a process* at the hinder extremity of the sixth ventral segment of the abdomen ; and which effects a sort of transition between its more immediate allies above-named and its more remote ones, *Phib. Cantori* and *Phib. Westwoodi*, in which

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* Serving, *possibly* as actually in *Necroscia sparaxes*, &c., as a *point d'appui* for the forceps of the male in copulation.

the female has minute scale-like rudiments of organs of flight, the metanotum proper about equal to the medial segment, and the hinder extremity of the sixth ventral segment of the abdomen unarmed. In *Phib. virgea* ♂, as I have already pointed out (P. A. S. B., July 1877), the metathoracic and mesothoracic tubercles figured by Westwood are exceedingly minute rudiments of organs of flight; and the same relation of length subsisting between the two divisions of the metathorax in *Phib. acanthopus* and *Phib. Annamalayanum* obtains in it (*Phib. virgea*, the male of which we know to be a wingless insect or practically so), I expect that the males of these two species with also prove to be apterous; in which event, then the winged male ascribed to *P. acanthopus* by De Haan, and by Westwood following him, will belong to another species.

With the single exception of *Lonchodes brevipes*, this is the only species of *Phasmidæ* at present known to us from the Malabar Coast and from the hill-tops of Southern India!

PHIBALOSOMA WESTWOODI, Pl. III, Fig. 1, ♀.

Phib. Westwoodi, Wood-Mason, J. A. S. B., 1875, Vol. xliv, part ii, p. 216, ♀; P. A. S. B., July 1877.

I have examined with Professor Westwood the typical specimens of *P. Cantori* preserved in the Hopeian collection at Oxford and I find that the insects have been legitimately united by their describer; the female having small equal blunt representatives of the conspicuous cephalic tubercles seen in the male; these tubercles not having been represented by Professor Westwood in his figure of the former, I was led to suggest (*loc. supra. cit.*) that *P. Westwoodi*, which had cephalic tubercles, and those of unequal size, might be the opposite sex of *P. Cantori* ♂, the true female of which had been represented as having none. These tubercles are in *P. Cantori* placed further forwards on the disk of the head than in the present species.

Lopaphus, (Westwood), W. M.

Bacteria, Westwood (p.), *Lonchodes*, Westw. (p.), *Lopaphus*, Westw. (p.) *Necroscia*, Westw. (p.).

In J. A. S. B., Vol. XLIV, Part II, 1875, p. 217, I have described a remarkable insect, obtained by my native collector at Johore, as the female of Westwood's *Necroscia Iolas*, and pointed out the very close relationship of this species to *Lopaphus brachypterus*, *Lonchodes porus*, *L. Bootanicus*, and *Bacteria Baucis*, all of which should find a place in the same genus with it.

M. C. Stäl has described the same insect from a Malaccan specimen under the name *Candaules Sparnius*.

1. LOPAPHUS BRACHYPTERUS.

Phasma brachypterum, DeHaan, Orthopt. Orient., p. 125, pl. xiii, fig. 2, ♀.
Lapaphus brachypterus, Westwood, Monogr. Phasm., p. 99, ♀.

HAB. A single specimen of the adult female was captured, with several larvæ of the same sex, by my native collector at Johore in the Malay Peninsula; Sumatra (*DeHaan*).

Well-developed organs of flight in both sexes.

2. LOPAPHUS IOLAS, Pl. III, Fig. 2, ♀.

Necroscia Iolas, Westwood, Monograph *Phasmidæ*, 1859, p. 145, pl. xix, fig. 2, ♂.
Lopaphus Iolas, Wood-Mason, J. A. S. B., 1875, Vol. xliv, pt. ii, p. 217, ♂. ♀.
Candaules Sparnius, Stål, Recens. Orthopt., III, p. 87, ♀.

HAB. Numerous males and females and larvæ captured at Johore by my native collector; Malacca (♂ *A. R. Wallace*, ♀ *C. Stål*). The typical specimen of the male is now in the Hopeian Collection at Oxford.

Tolerably well-developed organs of flight in the male, but rudimental tegmina only in the female.

3. LOPAPHUS PORUS.

Lonchodes porus, Westwood, Monogr. *Phasmidæ*, 1859, p. 42, pl. vii, fig. 9, ♂.
,, ,, Wood-Mason, P. A. S. B., 1877, p. 162, ♂ ♀.

HAB. Throughout the valley of the Houng-da-rau, Upper Tenasserim.

The male has minute rudiments of organs of flight, the only vestiges of which in the female are four minute yellowish spots.

4. LOPAPHUS BOOTANICUS, Pl. II, Fig. 1, ♂.

Lonchodes Bootanicus, Westwood, Monograph of *Phasmidæ*, 1859, p. 43, pl. xxvi, fig. 8, ♀.

A male and a female from Sámagúting measure:—

♂. Total length 3 inches 3·75 lines; head 1·5; proth. 1·75; mesoth. 9·75; metath. 4·75; abd. 18·25 + 3·75 = 22; antennæ 3 inches 5 lines. (*Type*).

♀. Total length 4 in. 0·5 line; head 2·5; proth. 2·75; mesoth. 11·25; metath. 5·25; abd. 22 + 4·75 = 26·75 lines; antennæ 3 inches 3 lines.

The typical specimen of the female in the India (formerly East India Company's) Museum, S. Kensington, a much shrivelled and mutilated insect, wanting the terminal segment of the abdomen, is rather larger and consequently proportionately slightly longer as to the mesothorax than the specimen of which the measurements are given above: in it the mesothorax and metathorax exactly measure 13·5 and 5·75 lines respectively.

HAB. The only precise locality for the species which it is at present in my power to give is Sámagúting, Nágá Hills, whence specimens preserved in alcohol have been sent to me by Captain J. Butler, and are now in the Indian Museum.

The organs of flight have entirely disappeared from this as well as from the following species.

5. LOPAPHUS BAUCIS, Pl. II, Fig. 2, ♂.

Bacteria Baucis, Westwood, Monogr. *Phasmidæ*, 1859, p. 21, pl. viii, fig. 8, ♀.
Lonchodes Baucis, Wood-Mason, *l. s. cit.*

HAB. Abundant in the neighbourhood of Sibságar, Assam, whence I have received numerous individuals of both sexes—dried as well as in alcohol—from my valued correspondent, Mr. S. E. Peal, to whom I am also indebted for coloured sketches and much information respecting *Phasmidæ* and other Arthropods. And apparently throughout the N. E. frontier country.

The accompanying figures were taken from one of the numerous specimens collected by Mr. Peal.

I have examined the typical specimen of the female preserved in the National Collection, and I find that the stiff brown bristles figured and described by Westwood as fringing the sides of the abdomen at its base are present on one side of the body only, that they have no organic connection with the integument of the insect, and that some similar bristles lie scattered quite irregularly over the basal joints of the adjacent leg, like spelicans spilled upon a table; moreover, no trace of such setae is detectible in a specimen of the same sex and species placed alongside of the type in the same drawer, nor in any one of the multitude of specimens in the Indian Museum. The setæ, which are apparently of a vegetable nature, have evidently got jammed between the dorsal and ventral arcs of the segments as the membrane connecting these at the sides contracted in drying.

NECROSCIA PHÆTUSA.

N. Phætusa, Westwood, Monogr. *Phasmidæ*, p. 137, pl. xxxviii, fig. 4, ♂.
N. Gargantua, id., op. cit., p. 130, pl. xxix, fig. 3, ♀ *as male.*

On my informing Professor Westwood that his *N. Gargantua*, which from the mutilated condition of the terminal segments of the abdomen and from the presence of ocelli he had felt compelled to describe as a male, was in reality of the opposite sex, he at once pointed out *N. Phætusa* ♂ as its true and legitimate partner.

HAB. A perfect specimen of the female, captured by my native collector on Sinkieb Island, is in the Indian Museum. The typical specimens in the Hopeian collection at Oxford were both collected by Mr. A. R. Wallace, at Sarawak, in Borneo.

Obs. It is possible that the Sinkieb specimen, when actually compared with Westwood's typical one, may turn out to differ in much the same manner as the species of *Bacteria* from the same island does from *B. Sarawaca*, Westw.

NECROSCIA HILARIS.

Phasma (*Necroscia*) *hilare*, Westwood, Cab. Orient. Entom. p. 77, pl. 38, fig. 1, ♀ (*Assam*).

Necroscia hilaris, id., Monogr. *Phasmidæ*, p. 155, ♀.

„ *Virbius*, id., op. cit. p. 154, pl. xvi, fig. 2, ♂ (*Malacca*).

The Indian Museum has long possessed numerous examples of *N. hilaris* ♂ ♀, both from Sikkim (*L. Mandelli*) and from the neighbourhood of Sibságar, Assam (*S. E. Peal*); but the identification of the male as *N. Virbius*, Westw. was only recently made by Professor Westwood and myself while looking through the collection of *Phasmidæ* in the Oxford Museum.

NECROSCIA MENAKA.

N. Menaka, Wood-Mason, Ann. & Mag. Nat. Hist., 1877, Ser. 4, Vol. xx, p. 130, ♀.

" ♀. Body elongate, stoutish, of tolerably uniform width throughout. Head large, oblong, parallel-sided; vertex divided by three notches into four tubercles. Pronotum shorter and narrower than the head, flat, with a few minute granules. Mesothorax slightly tapering from the insertion of the legs forwards, granulate above and below and on the sides; its dorsal arc longitudinally carinate, granulate along the top of the ridge and at the edges. Abdomen tapering slightly from the base to the emarginate apex, which carries a longitudinally carinate semioval plate; its terminal segments, dorsal and ventral, constructed much as in *Necroscia Salmanazar*, *N. maculicollis*, and *N. Sparaxes*, in all three of which also the sixth ventral segment is furnished at its hinder extremity with a peculiarly shaped process, which serves as the *point d'appui* for the claspers of the male during copulation.* Legs long and stout; the fore tibiæ and the femora and the tibiæ of the two posterior pairs subtriquetrous and carinate along the middle of the under surface. Tegmina oval, with but a slight compressed conical elevation of the carina. Wings reaching about to the end of the fifth abdominal segment; the costal area luteous brown, like the body and legs; the costal vein divided at the middle of its length, the two branches uniting again near the extremity; posterior area milk-white, conspicuously tessellated with dark smoky-quartz-colour, all the transverse veinlets being broadly and distinctly margined on each side with this colour.

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* A fact ascertained by actual observation in *N. maculicollis*.

"Total length 3 inches 7 lines; head 3·25 lines, prothorax 2·5, mesothorax 7·25; abdomen 1 inch 8 lines + 4 = 2 inches; antennæ 2 inches 5 lines; wings 1 inch 10 lines; tegmina 5·5 lines; fore femur 12·75 lines, tibia 14·5, tarsus 6·75; intermediate femur 8·5 lines, tibia 9·5, tarsus 5; posterior femur 13·5 lines, tibia 14, tarsus 5·75.

"*Hab.* Southern slopes of the Khasi hills.

"Closely allied to *N. Salmanazar*, Westw. (Monogr. Phasm. p. 153, pl. xvi. fig. 6), ♀, from the Philippines."

A specimen marked 'Borneo' is in the Hopeian collection at Oxford.

PHYLLIUM WESTWOODI, Pl. III, Fig. 3, ♂.

P. Westwoodi, Wood-Mason, J. A. S. B., 1875, Vol. xliv, pt. ii, pp. 218-19, ♂, ♀ pl. xvii, ♀.

I now give a figure of the male from the specimen obtained at Pahpoon by Mr. W. Davison, to whom I have since been indebted for a fine series of specimens of the same species all taken by him from one lime-tree at Malewoon in the Mergui District; these differ from the typical ones only in their rather smaller size, and are of value in proving that I had correctly paired my insects on structural grounds alone. Amongst this series of specimens are larvæ of the male, which shall be figured and described on a future occasion, as they show, in their lozenge-shaped abdomen, it is hardly doubtful, an ancestral phase of the species, and thus point to *Ph. Gergon* of the Philippines, which is lozenge-shaped as to the abdomen in the adults of both sexes.

1. PHYLLIUM LOBIVENTRE.

Ph. lobiventre, Blanchard in Dumont d'Urville, Voy. au Pôle Sud, Zoologie, iv, 359, Orthopt. pl. i, fig. 9, ♂.
" Westwood, Monogr. *Phasmidæ*, p. 174 ♂. ♀, pl. xxxix, fig. 5, ♀.
Chitoniscus lobiventre, Stål, Recensis Orthopt., III, p. 105, ♀.

HAB. I have just purchased a female of this species from the island of Viti Lebu; so that we now have both species of this section of the genus.

2. PHYLLIUM FEEJEANUM.

Ph. Feejeanum, Westwood, Trans. Entom. Soc. London, 3rd Series, Proceedings, 4th April 1864, p. 17, ♂ ♀.
Ph. Novæ-britanniæ, Wood-Mason, Ann. & Mag. Nat. Hist., Ser. 4, 1877, Vol. xx, p. 76, ♀.

While looking through the collection of *Phasmidæ* in the Oxford Museum I met with the two sexes of an insect, to which no name had yet been affixed, but the female of which was clearly identical with one of those recently described by me in the 'Annals and Magazine of Natural History,' and which Prof. Westwood, who has since furnished me with the above reference, informed me was one of the types of a species described by himself several years before.

HAB. Fiji Islands *(Westwood)*; and New Britain (*J. W. M.* fide *C. French*).

EXPLANATION OF THE PLATES.

(N. B. All the figures are of the natural size except where the contrary is stated.)

Plate II.

Fig. 1. *Lopaphus Bootanicus*, Westw. ♂. 1*a*; The terminal segments of the abdomen, from the side.

Fig. 2. *Lopaphus Baucis*, Westw. ♂. 2*a*; The terminal segments of the abdomen, from the side.

Fig. 3. *Bacteria Shiva*, Westw. ♂. 3*a*; The terminal segments of the abdomen, from the side, enlarged: 3*b*; the same, from above, enlarged.

Plate III.

Fig. 1. *Phibalosoma Westwoodi*, W.-M., ♀, the head, from above. 1*a*; The same, from the right side. 1*b*; the same, from the left. 1*c*; the terminal segments of the abdomen, from above. 1*d*; the same, from the side.

Fig. 2. *Lopaphus Iolas*, Westw. ♀. 2*a*; the terminal segments of the abdomen, from the side. 2*b*; the same, from below.

Fig. 3. *Phyllium Westwoodi*, W.-M., ♂. 3*a*; The terminal segments of the abdomen, from above. 3*b*; the same, from below.

Fig. 4. *Lonchodes Austeni*, W.-M., ♂. 4*a*; The terminal segments of the abdomen, from the side, enlarged. 4*b*; the two hindermost divisions of the thorax with the abdomen, in profile, to show the dorsal spines.

INDEX.

☞ Names of new genera and species have an asterisk (*) prefixed.

*Actinura Oglei, 42
Alycæus amphora, 29
Ampullaria Theobaldi, 37
Asiatic Bears, 315
Assam Earthquakes, 294
Bacillus scabriusculus, 342
,, Westwoodi, 342
Bacteria Baucis, 347, 349
,, Sarawaka, 343
,, Shiva, 342
* ,, Sinkiebensis, 343
Barometric Tides, 45
Bithynia goniomphalus, 29
* ,, moreletiana, 29
,, turrita, 29
Burmese Flora, 49
Candaules Sparnius, 347, 348
Canis famelicus, 321
Catalogue of Cyclones in the Bay of Bengal up to 1876, 328
Cervus Duvaucelli, 319
Chiloloba acuta, 344 (*n.*)
*Chimarrogale, n. g., 262
Chitoniscus lobiventre, 351
*Corbicula Andersoniana, 41
,, Lamarckiana, 40
* ,, Yunnanensis, 40
*Crocidura Blanfordii, 269
,, Blythii, 264
* ,, Bidiana, 276
* ,, fulvocinerea, 263
* ,, Kingiana, 281
,, macrotis, 271
* ,, Nilgirica, 274
,, nitidofulva, 272
* ,, Pealana, 267
* ,, pygmæoides, 279
* ,, rubicunda, 277
* ,, rubricosa, 280
* ,, Sindensis, 266
* ,, Stoliczkana, 270
* ,, subfulva, 278
* ,, Travancorensis, 275
Cyclones, catalogue of, in the Bay of Bengal, 328
Cyclophorus fulguratus, 28
,, sublævigatus, 27
,, zebrinus, 28
Cynopterus marginatus, 310
Ennea bicolor, 25
Entoria spinicornis, 342
*Glessula Blanfordiana, 26
,, obtusa, 25
,, pyramis, 26
,, subfusiformis, 26
Golunda Ellioti, 293
Helicarion gigas, 24
* ,, magnificus, 24
,, præstans, 25
* ,, resplendens, 23
,, venustum, 24
Helix Andersoni, 17
,, bolus, 22
,, capitium, 21
,, catostoma, 20
,, delibrata, 21
,, Huttoni, 20
,, Oldhami, 19
* ,, perplanata, 19
,, Phayrei, 20
,, scalpturita, 22
,, similaris, 22
,, tapeina, 17
,, ,, var. akoutongensis, 17
* ,, ,, var. Bhamoensis, 18
,, ,, var. rotatoria, 18
,, trichotropis, 19
,, Zoroaster, 22
Heterorrhina elegans, 344 (*n.*)
Himalayan Glaciation, note on 11
Kangra Big Stones, 7
Lagomys, 323, 326
,, auritus, 326
,, rufescens, 327
,, Roylei, 326
* Lepus Biddulphi, 324

* Lepus hypsibius, 325
,, pallipes, 325
,, Pamirensis, 325
,, Stoliczkanus, 325
,, Tibetanus, 325
,, Yarkandensis, 325
Limnæa acuminata, 2[illegible]
* ,, Andersoniana, 26
,, luteola, 27
* ,, Yunnanensis, 26
Lonchodes auscultator, 345, 346
,, Austeni, 343
,, Baucis, 349
,, Bootanicus, 347, 348
,, brevipes, 344
,, Crawangensis, 346
,, nematodes, 343, 346
,, nodosus, 344
,, porus, 347, 348
,, pterodactylus, 344
,, spinicollis, 345
,, Westwoodii, 342
Lopaphus, 347
,, Baucis, 349
,, brachypterus, 347
Lutra vulgaris, 324
Mamh of Baluchistan, 315
*Margarya, n. gen., 30
* ,, melanioides, 30
Megaderma lyra, 312
Melania Iravadica, 33
,, jugicostis, 33
,, Reevei, 34
,, ,, var. imbricata, 34
,, scabra, 34
,, tuberculata, 32
Menaka scabriuscula, 342
Metalleutica splendida, 344 (*n.*)
Mus Bactrianus, 324
,, mettada, 290
*Mustela Stoliczkana, 260
Nanina arata, 15
,, attegia, 17
,, Barakporensis, 17
,, diplodon, 17
,, honesta, 16
,, hypoleuca, 16
,, pansa, 17
,, resplendens, 16
Necroscia Gargantua, 349
,, hilaris, 350
,, Iolas, 347, 348
,, maculicollis, 350
,, menaka, 350
,, phaetusa, 349
,, sparaxes, 343, 350
,, virbius, 350
Oorial, 327
*Ovis Blanfordi, 327, 328
,, cycloceros, 327, 328
Ovis Gmelini, 327
,, Hodgsoni, 319, 327
,, Kareleni, 327
,, Vignei, 327, 328
Paludina Bengalensis, 14, 32
,, Chinensis, 31
,, dissimilis, 31
,, ,, var. viridis, 31
,, Siamensis, 32
*Paludomus Andersoniana, 35
,, ,, var. Peguensis, 35
* ,, Blanfordiana, 37
* ,, Burmanica, 36
,, ornata, 35
,, regulata, 36
*Pellorneum pectoralis, 41
Phasma (Bacteria) nematodes, 343
,, ,, nodosum, 344
,, brachypterum, 348
,, Crawangense, 346
,, (Necroscia) hilare, 350
,, Sumatranum, 344
Phasmidæ, notes on, 342
Phibalosoma acanthopus, 346
,, Annamalayanum, 346
,, Cantori, 346
,, virgea, 346
,, Westwoodi, 346, 347
Phyllium Feejeanum, 351
,, Gorgon, 351
,, lobiventre, 351
,, Novæ-britanniæ, 351
,, Westwoodi, 351
Phyllorhina fulva, 312
,, larvata, 312
Planorbis compressus, 27
,, exustus, 27
*Pomatorhinus stenorhynchus, 43
Prisomera spinicolle, 345
,, spinicollis, 345
Pterocyclus Feddeni, 29
,, insignis, 29
Pupa cœnopictus, 23
,, insularis, 22
,, Salwiniana, 23
Rhaphiderus cerberus, 343
,, scabrosus, 343
Scotophilus pallidus, 310
,, Temminckii, 310
Spiraculum Andersoni, 28
,, Avanum, 28
,, Mastersi, 313
*Soriculus gracilicauda, 282
Stenogyra gracilis, 25
Stheneboea Brunneri, 342
Streptaxis Theobaldi, 25
Succinea acuminata, 23
Trochomorpha percompressa, 15
*Unio Andersoniana, 40
,, Bhamoensis, 39

Unio Bonneaudi, 39
* ,, Burmanus, 38
,, Feddeni, 38
* ,, fragilis, 39
,, marginalis, 37
,, ,, var. corrianus, 38
,, pugio, 39
Ursus arctos, 316
* ,, Gedrosianus, 317, 320, 323
,, isabellinus, 316, 318, 320
,, Malayanus, 320
,, (Melursus) labiatus, 316, 318, 320
,, pruinosus, 315, 318, 319, 320
,, syriacus, 316
Ursus tibetanus, 316, 318
,, torquatus, 316, 318, 320
*Veronicella, n. sp., 23
,, Birmanica, 23
Vesperugo Abramus, 310
* ,, Blanfordi, 312
,, Kuhlii, 311
,, nasutus, 311
,, Tickelli, 312
*Vulpes canus, 321
,, famelicus, 321
,, montanus, 323
Wardwán and Chináb Mammalia, 283

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LIST OF CONTRIBUTORS.

Page

ANDERSON, J. ;—*Description of some new and little known Asiatic Shrews in the Indian Museum, Calcutta,* 261

BLANFORD, H. F. ;—*Note on the Variation of the Barometric Tides in connexion with Diurnal Land and Sea-breezes,* 45

———— ;—*Catalogue of the recorded Cyclones in the Bay of Bengal up to the end of* 1876, ... 328

BLANFORD, W. T. ;—*On an apparently undescribed Weasel from Yarkand,* 259

———— ;—*On the Metád Rat* (Golunda meltada, *Gray*), *with a note on* Golunda Ellioti, (Plate 1), ... 288

———— ;—*Description of* Spiraculum Mastersi, ... 313

———— ;—*Note on two species of Asiatic Bears, the* "Mamh" *of Balúchistán and* Ursus pruinosus, *Blyth, of Tibet, and on an apparently undescribed Fox from Balúchistán,* 315

———— ;—*On an apparently new hare and some other mammalia from Gilgit,* 323

CAMPBELL, J. F. ;—*On Himalayan Glaciation,* 1

DOBSON, G. E. ;—*Notes on a collection of* Chiroptera *from India and Burma, with descriptions of new species,* 310

GODWIN-AUSTEN, H. H. ;—*Descriptions of three new species of Birds of the Genera* Pellorneum, Actinura, *and* Pomatorhinus ; *lately collected in the neighbourhood of Saddya, Assam, by* MR. J. OGLE, *of the Topographical Survey,*...................... 41

HARDING, C. ;—*Memorandum on the diurnal variation of Atmospheric Pressure at the Sandheads, with a prefatory note by* H. F. BLANFORD,.. 339

HUME, A. O. ;—*On a supposed new Sheep from the Central Hills of Kelat,* 327

KEATINGE, R. H., COLONEL ;—*Record of the Occurrence of Earthquakes in Assam during the years* 1874-75-76, ... 294

KURZ, S. ;—*Contributions towards a knowledge of the Burmese Flora,* 49

Page

LYDEKKER, R. ;—*Notes on the Mammalian Fauna of the Wardwán and Upper Chináb Valleys,* 283

MEDLICOTT, H. B. ;—*Note on Mr. J. F. Campbell's Remarks on Himalayan Glaciation,* 11

NEVILL, G. ;—*List of the Mollusca brought back by* DR. J. ANDERSON, *from Yunnan and Upper Burma, with descriptions of new species,* 14

WOOD-MASON, J. ;—*Notes on* Phasmidæ, ... 342

Date of issue of the different numbers of Journal, Part II., 1877.

No. I.—Containing pp. 1—48, with two wood-cuts,—was issued on 30th May, 1877.

No. II.—Containing pp. 49—258,—was issued on 2nd August, 1877.

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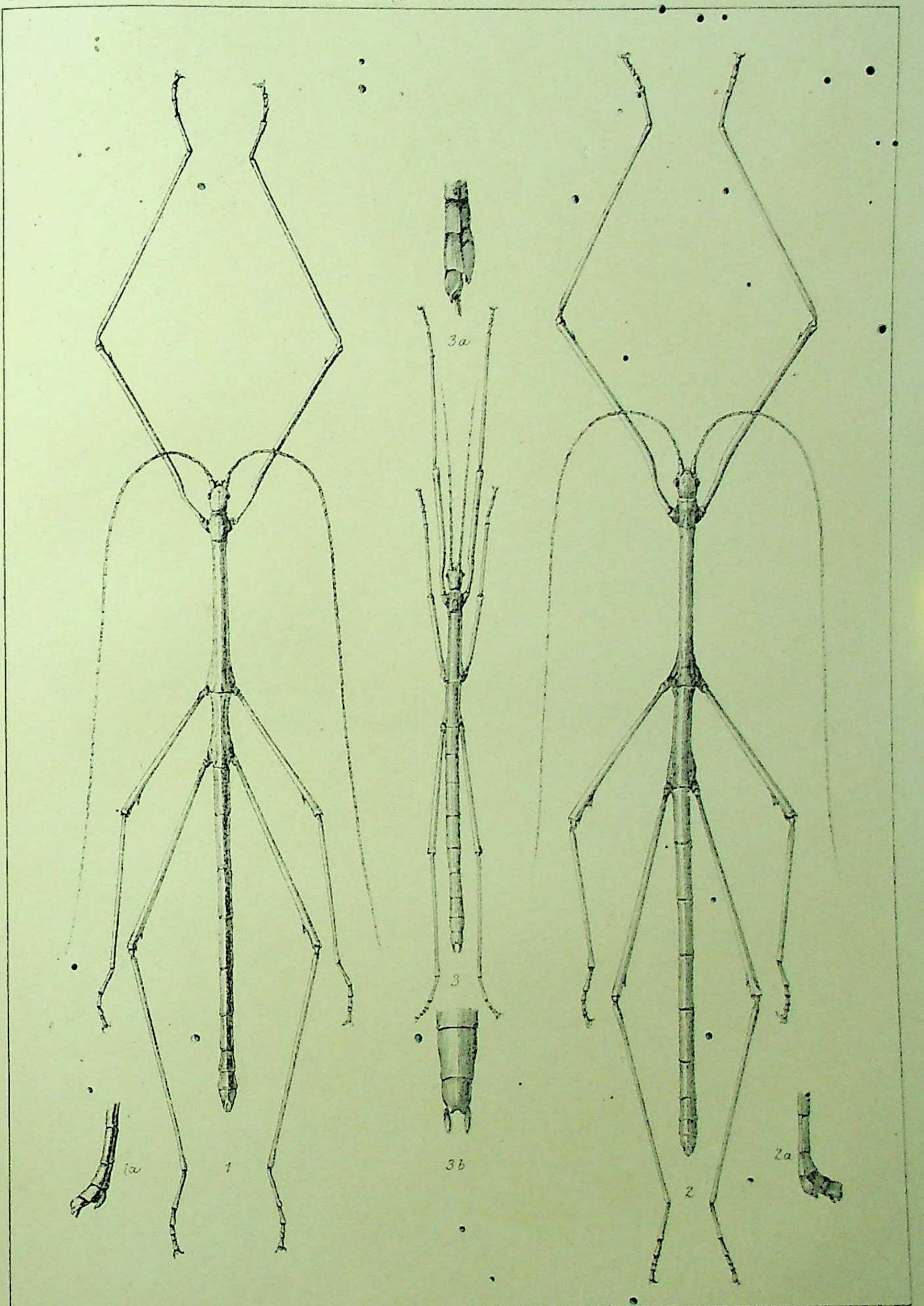
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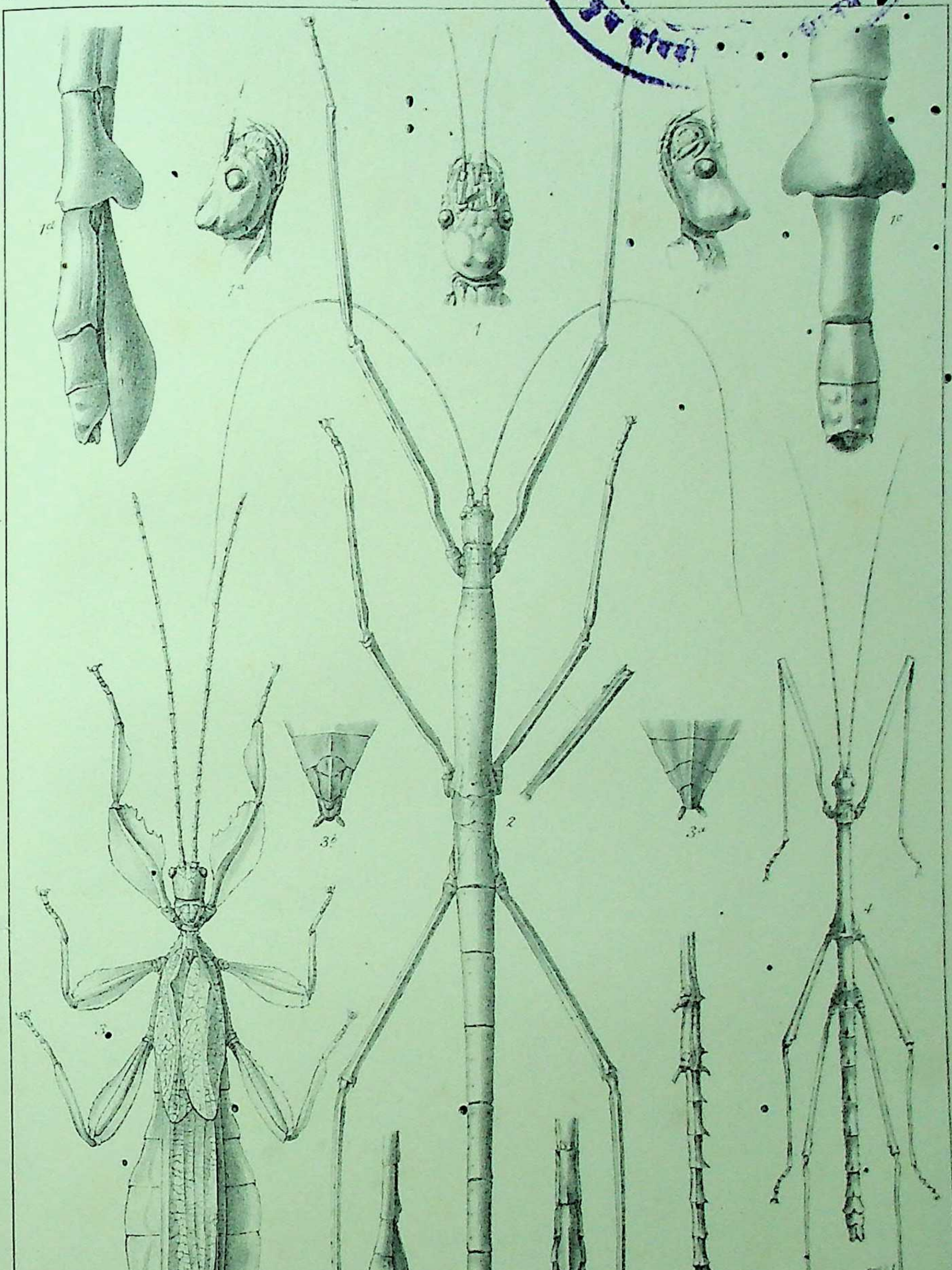
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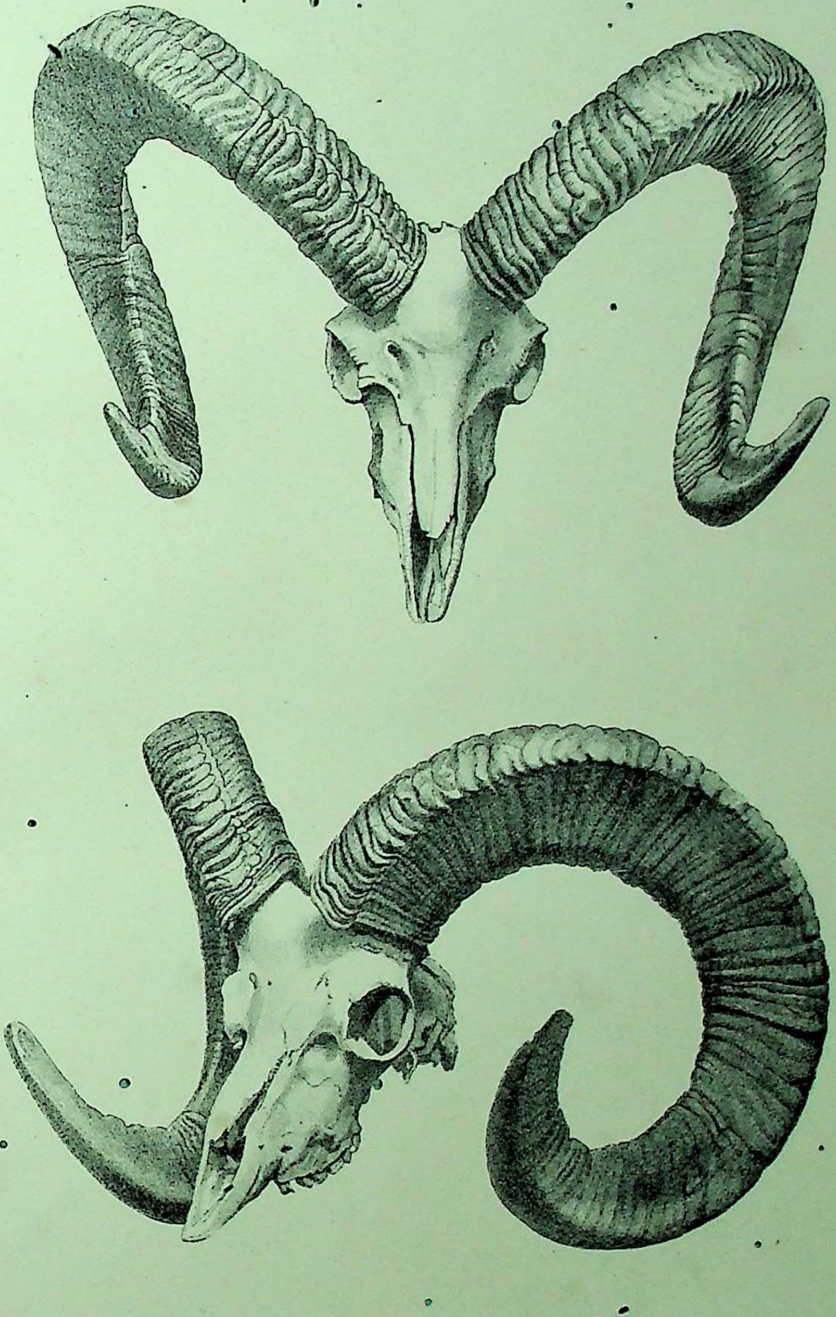

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CONTENTS

OF THE NATURAL HISTORY PART (PT. II.) OF THE

JOURNAL OF THE ASIATIC SOCIETY OF BENGAL FOR 1876.

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No. 2, (issued August 18th, 1876). *An Account of Experiments made in* 1875 *and* 1876 *in various parts of India, for the purpose of comparing the observed Temperature of the Dew-point with that computed from the Psychrometer by different methods of Reduction.*—*By* H. F. Blanford.—*List of the Birds collected on the Expedition into the Dafla Hills, Assam, together with those obtained in the adjacent Darrang Terai* (Pls. III and IV).—*By* H. H. Godwin-Austen.—*On the Physical Geography of the Great Indian Desert with especial reference to the former Existence of the Sea in the Indus Valley; and on the Origin and Mode of Formation of the Sand-hills.*—*By* W. T. Blanford.

No. 3, (issued November 14th, 1876). *A Sketch of the Vegetation of the Nicobar Islands* (Pls. XII and XIII).—*By* S. Kurz.—*Description of* Golunda Ellioti *from Sind* (Pl. X).—*By* W. T. Blanford.—*On the* Cyclostomacea *of the Dafla Hills, Assam* (Pls. VII and VIII, A).—*By* H. H. Godwin-Austen.—*Descriptions of some new Land and Fresh-Water Shells from India and Burmah* (Pl. XIV).—*By* W. Theobald.—*Description of new Species of* Blattidæ *belonging to the Genus* Panesthia.—*By* J. Wood-Mason.

No. 4, (issued April 19th, 1877). *Fifth List of Birds from the Hill Ranges of the North-East Frontier of India* (Pls. V, VI, and IX).—*By* H. H. Godwin-Austen.—*Contributions towards a Knowledge of the Burmese Flora.*—*By* S. Kurz.—*On the* Helicidæ *collected during the Expedition into the Dafla Hills, Assam* (Pl. VIII).—*By* H. H. Godwin-Austen.—*On the Physical Explanation of the Inequality of the two Semi-diurnal Oscillations of Barometric Pressure.*—*By* H. F. Blanford.—*Contributions towards the knowledge of the Fossil Flora in India. I. On some Fossil Plants from the Damuda Series in the Raniganj Coalfield, collected by* Mr. J. Wood-Mason (Pls. XV—XXI).—*By* Ottokar Feistmantel.

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